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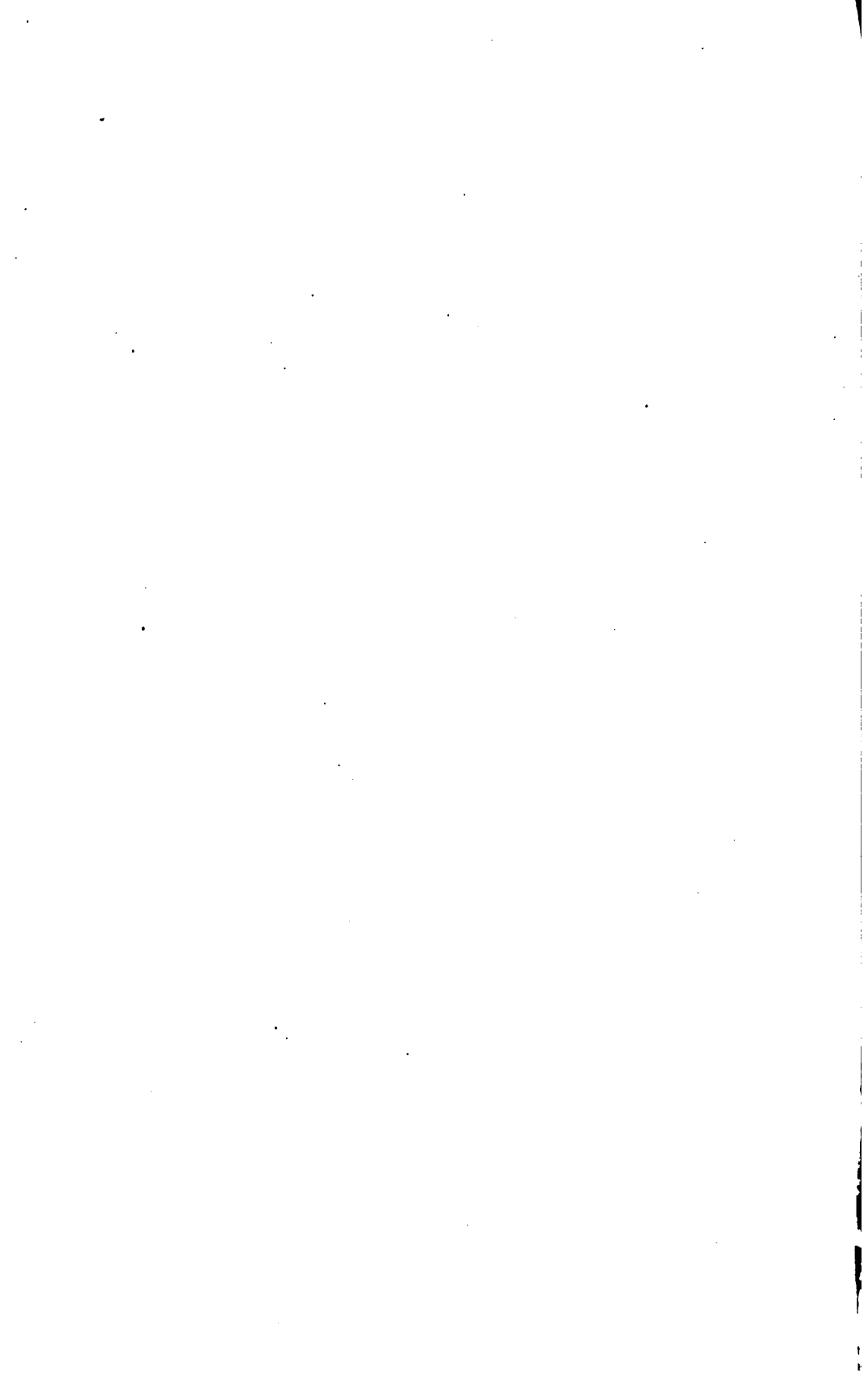
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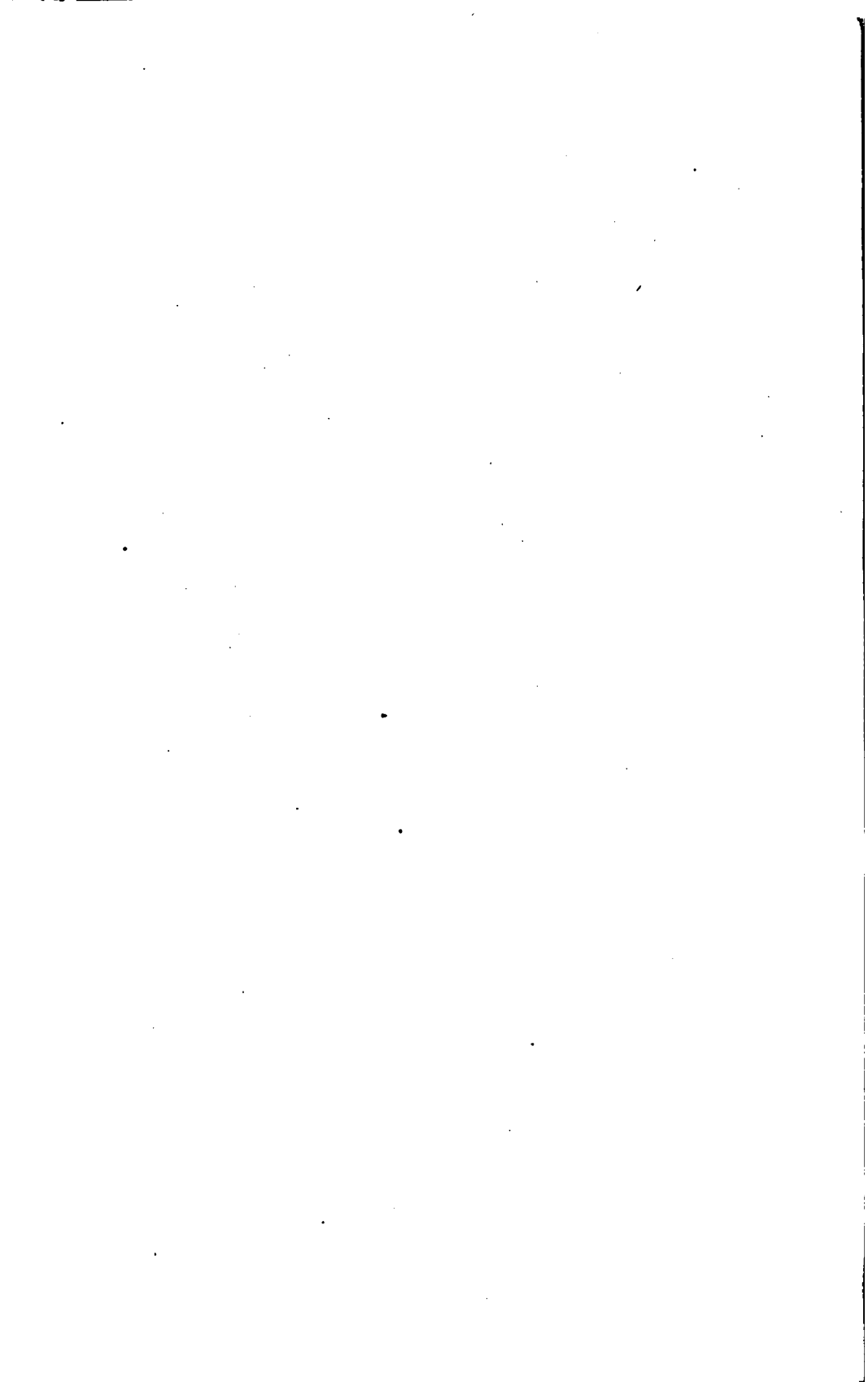
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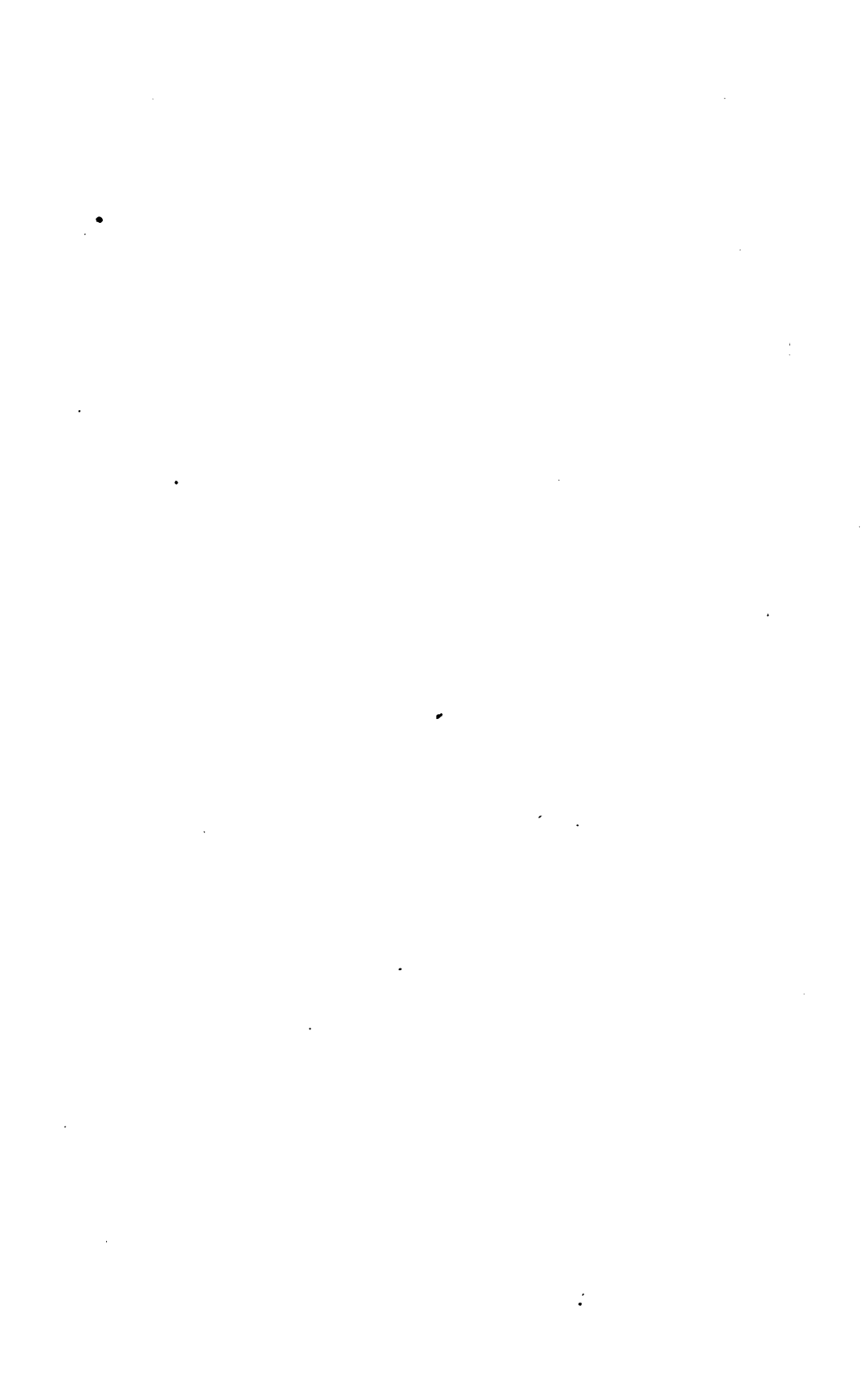
Received January 28, 1947

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WAR DEPARTMENT :: OFFICE OF THE SECRETARY

EIGHTH ANNUAL ¢
REPORT OF THE
PHILIPPINE COMMISSION
TO THE SECRETARY OF WAR

1907

(IN THREE PARTS)

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1/28/47 Mr. North

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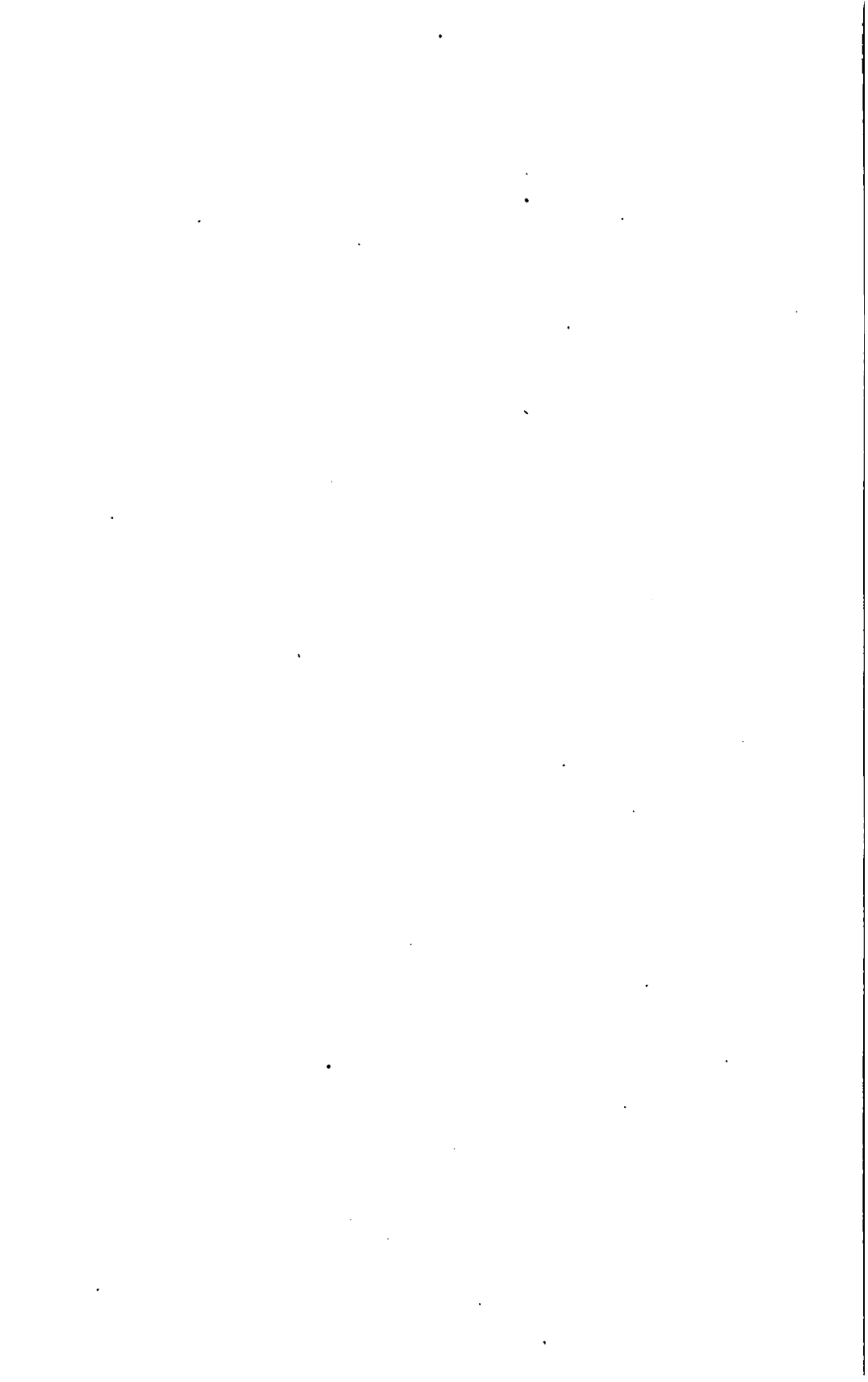
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REPORT OF THE SECRETARY OF THE INTERIOR.



REPORT OF THE SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
Manila P. I., October 28, 1907.

GENTLEMEN: I have the honor to present the sixth annual report of the operations of the department of the interior, which, unless otherwise expressly stated, covers the year ended June 30, 1907.

ORGANIZATION OF THE DEPARTMENT.

The only important change in the organization of the department is the transfer of the division of ethnology from the bureau of education to the bureau of science. At the time the bureau of non-Christian tribes was abolished, provision was made for continuing its work by creating a division of ethnology in the bureau of education. This action was taken in the hope that ethnological investigation might be carried out by school teachers during vacation periods and at other times, and that economy might thus be achieved.

The former bureau of non-Christian tribes not only carried on investigations relative to non-Christian tribes, with a view to gaining information which was of scientific interest or might serve as a basis for legislation and administration calculated to better their condition, but, under the direction of the secretary of the interior, made such investigations as he deemed necessary into the practical operation of existing laws for the government of such tribes and into the conduct of those who governed them. The transfer of this work to the bureau of education left the secretary of the interior in a somewhat anomalous position. He had executive control over five provinces organized under the special provincial government act, and largely populated by non-Christians, and he was vested with authority to approve or disapprove the acts of governors and provincial boards relative to the non-Christian inhabitants of all other provinces except the Moro Province, but was left without agents to make such investigations as he might deem necessary, and was thus forced to depend upon the courtesy of another department for assistance which was essential to the proper performance of his duty. This fact, together with the further one that expectations as to the ability of school teachers to perform ethnological work were not realized, led to the transfer of the division of ethnology from the bureau of education to the bureau of science. This change places it where it logically belongs, in view of the fact that one part of its work is strictly scientific while the other part is necessarily carried on at the request, and usually under the direction, of the secretary of the interior.

INSPECTION OF PROVINCES.

Section 29 of act numbered 1396 (special provincial government act) imposes upon the secretary of the interior the duty of inspecting at least once during the fiscal year each of the provinces organized under said act.

This inspection for the year ending June 30, 1906, was completed in April. Further inspection would therefore not have been timely in the early months of the year beginning July 1, 1907, nor would it then have been practicable in Benguet, Lepanto-Bontoc, and Nueva Vizcaya on account of the interruptions to overland travel incident to the rainy season.

NORTHERN INSPECTION TRIP.

On October 15, 1906, the secretary of the interior sailed for the United States on six months' leave, and upon his return, on April 14, 1907, found that his presence was required immediately at Baguio in order to make a quorum of the Commission. It was not until May 22 that he was at liberty to start on his annual tour of inspection. His first trip, which was made in company with the governor-general, began at Baguio, Benguet, on this date, covered the provinces of Benguet, Lepanto-Bontoc, and Nueva Vizcaya, and ended at Manila on June 24. As it was manifestly impossible to complete the inspection of Mindoro and Palawan in the remaining six days of the fiscal year, and as other duties made the presence of the secretary of the interior at Manila necessary at this time, the inspection of the last-named provinces was delayed, but it was completed on October 3, 1907.

PUBLIC ORDER IN BENQUET, LEPANTO-BONTOC AND NUEVA VIZCAYA.

Conditions in Benguet, Lepanto-Bontoc, and Nueva Vizcaya were found to be quite satisfactory. The people of these provinces are contented and fairly prosperous. Their townships and settlements are for the most part reasonably well governed, and the state of public order leaves little to be desired. There have been but a very few isolated cases of head-hunting during the year. At the time of the downfall of Spanish sovereignty the trail between Bagabag and Carig was protected by four permanent garrisons and travelers were allowed to pass over it only under convoy, on account of the danger of attack by head-hunters. At present there is no garrison anywhere on this trail and women may be met passing over it unattended.

PUBLIC IMPROVEMENTS IN BENQUET, LEPANTO-BONTOC AND NUEVA VIZCAYA.

Under the operation of the law imposing a public improvement tax, means of communication are being rapidly improved. In Benguet all but one of the fords which have heretofore interrupted traffic northward along the so-called "river trail" during the rainy season have now been eliminated by the construction of bridges, and the "hill trail" between Baguio and Cervantes, which follows a high divide throughout nearly its entire extent and is always free from interruption by swollen streams, is being steadily pushed toward completion.

In Lepanto-Bontoc the new trail to the coast has been completed as far as the boundary of the municipality of Tagudin and will

soon reach the sea. This trail is 30 miles long and its grade nowhere exceeds 6 per cent. It crosses but two streams of any considerable size, and these can be bridged readily. The trip from Cervantes to the sea can now be made in one day. The trip over the old trail usually occupied two and one-half days, and involved the climbing of many steep grades as well as the crossing of 13 fords, many of which became impassable for considerable periods during the rainy season.

Road work has also been pushed in the eastern part of Lepanto-Bontoc. The main trail north from Bontoc has been extended to Guinaan and Balbalasan, a distance of 80 miles. The trail to the top of Polis Mountain, on the way from Bontoc to Banaue in Nueva Vizcaya, has been improved and a good rest house has been built at its highest point. The old trail from this latter point to Banaue, with its steep ascents and heavy adverse grades, can soon be abandoned, as a new line has been surveyed which descends steadily on a grade of 6 per cent or less, and a trail along this line is rapidly approaching completion. The trail from Bagabag to Quiangan has been widened and greatly improved. In fact, as far as Payoan it is now practically a cart road.

The trail from Bagabag to the Isabela boundary has been greatly improved and could be converted into a cart road at comparatively small expense. Unfortunately, the Christian province of Isabela has done nothing to improve, or even maintain the trail and highway which formerly led from the provincial boundary of the towns of Cordon, Carig, and Echague. This is the more difficult to understand, as these towns are largely dependent upon Nueva Vizcaya for their rice. It is to be hoped that this situation, which results in bottling up the agricultural products of Nueva Vizcaya, can soon be remedied.

NEW BOUNDARIES FOR AMBURAYAN.

The recommendations embodied in the last annual report of the secretary of the interior relative to the establishment of new and more definite boundaries for the subprovince of Amburayan and the incorporation of the municipality of Tagudin with that subprovince as its capital have been carried out. An end has thus been put to many troublesome questions which caused friction between the provincial authorities of La Union, South Ilocos, and Lepanto-Bontoc, and adequate protection has been provided for the Igorot residents of La Union, many of whom had long suffered grievous abuses at the hands of their Christian neighbors.

ESTABLISHMENT OF THE SUBPROVINCES OF KALINGA AND APAYAO.

As recommended in the last annual report of the secretary of the interior, two new subprovinces, known as "Kalinga" and "Apayao," have been established. Kalinga appertains to the province of Lepanto-Bontoc and includes, roughly speaking, all the territory west of the Rio Grande de Cagayan inhabited by Kalingas, as well as the Saltan River valley, the upper part of which is peopled by wild Tinguians. Apayao, which forms a part of the province of Cagayan, includes all the remaining territory inhabited by wild tribes between the northern boundary of Kalinga, the Rio Grande de Cagayan, the

crest of the Cordillera Central, and the China Sea at the northern extremity of Luzon.

Señor Blas Villamor, who had previously served as governor of Abra and of Isabela, has been made lieutenant-governor of Apayao, and has already begun his work there with signal success.

Lieutenant-Governor Walter F. Hale of Amburayan, has been transferred to the subprovince of Kalinga, his work in Amburayan having merited this promotion. Thus far he has been able only to make a hasty trip through his new subprovince, it having been necessary for him to return to Amburayan in order to complete unfinished business.

The task before each of these lieutenant-governors, involving as it does the establishment of law and order among warlike peoples over most of whom no governmental authority of any sort has heretofore been exercised, is by no means easy, but it is believed that both are competent to perform the arduous duties imposed on them, and that in the not distant future, conditions as satisfactory as those which now prevail in Bontoc and Nueva Vizcaya will be brought about in Kalinga and Apayao.

UNGOVERNED TERRITORY IN NORTHERN LUZON.

The only part of Luzon in which there now exists no machinery for the exercise of governmental control over the inhabitants is the eastern Cordillera, from the vicinity of Baler and Casiguran northward to Cape Engaño.

According to the best information obtainable, this great unknown region is sparsely inhabited by negritos. The undersigned hopes personally to investigate conditions there at some time in the near future.

ESTABLISHMENT OF THE PROVINCE OF AGUSAN.

It has long been well known that deplorable conditions requiring remedial action existed among the non-Christian and "new-Christian"^a inhabitants in the provinces of Surigao and Misamis in the island of Mindanao; but until the task of establishing government over the more important tribes of northern Luzon could be completed, it seemed impossible to enter upon the work so urgently necessary in northern Mindanao.

As soon as practicable after provision had finally been made for the organization of the subprovinces of Kalinga and Apayao, further investigation into conditions in Surigao and Misamis was undertaken, and act No. 1693, which among other things creates the province of Agusan and the subprovinces of Butuan and Bukidnon, was passed on August 20, 1907. This act cuts off from the province of Misamis all territory inhabited by members of non-Christian tribes and makes of it a subprovince called Bukidnon from the name of the most important tribe inhabiting it. There are, however, some Subanos and a considerable number of Manobos in this subprovince.

All the former territory of the province of Surigao west of its eastern mountain chain was cut off and made the subprovince of

^a "New-Christians" is the name commonly applied in the Philippines to the members of non-Christian tribes who have recently received baptism.

Butuan. The subprovinces of Bukidnon and Butuan together form the province of Agusan.

Included within the territory of Butuan are three Christian municipalities. One of these, Talacogon, has but about 1,000 inhabitants and should never have been organized as a municipality, as it has neither men competent to hold office nor funds sufficient to maintain a municipal government. It will speedily be reorganized as a township. The other, Butuan, has well earned the reputation of being the worst-governed municipality in the Philippine Islands. Its inhabitants have now been given a reasonable time in which to put their town in a decent sanitary condition and to reform their municipal government, and have been warned that failure to do these things within the prescribed period will result in the reorganization of Butuan as a township. The third municipality, Cabadbaran, is well governed and prosperous. It was included in the province of Agusan because communication with Butuan will be far easier than with Surigao and because it is so surrounded by territory inhabited by non-Christians that any other disposition of it would involve much difficulty in establishing a satisfactory provincial boundary between Surigao and Agusan.

Among the reasons which led to the establishment of the province of Agusan the following may be mentioned:

Not one cent of the funds made available by the insular government for bettering the condition of the non-Christian inhabitants of Surigao and Misamis had ever been expended, the provincial boards and provincial governors having allowed them to accumulate without making the slightest effort to use them for the purposes for which they were set aside.

Not the slightest effort had been made in either province to enforce the law prohibiting the sale of alcoholic drinks to members of non-Christian tribes. On the contrary, such sale was carried on openly and upon a large scale in the capital of Misamis under the very noses of the provincial authorities.

Little if any effort had been made by the local authorities to check the smoking of opium, which is on the increase.

In Misamis no provincial governor had ever so much as visited the settlements of non-Christians or of new-Christians, although all of the latter could readily be reached on horseback in one to four days. Many of these settlements had been left without any officers whatever, and the most that had been done in any case was to appoint, in a perfunctory way, a president, vice-president, and councilors. These unfortunate officials served without pay and without any instructions as to their duties.

In Surigao nothing whatever had been done for the hill people. The settlements of "new-Christians," under the pretext that their inhabitants, having been baptized, were no longer members of non-Christian tribes, had been made "barrios" of the two municipalities of Butuan and Talacogon, and had in effect, been turned over to these municipalities for plunder. In both provinces the non-Christian and "new-Christian" inhabitants had in many instances been shamelessly robbed of their agricultural products, or if paid something for them, had received but a small fraction of their value.

The following schedule of values commonly paid at Cagayan for products brought in by the Bukidnon will sufficiently illustrate this point:

For one-half picul of gutta percha or hemp, worth approximately ₱12, a jar of salt worth ₱0.20.

For 3 pounds of hemp worth about ₱0.55, two boxes of matches costing ₱0.02 each.

For two bid-bids of hemp or gutta purcha, worth approximately ₱1.10, a package of cigarettes worth ₱0.06.

For one bid-bid of hemp, 1 Highland cream can full of kerosene oil.

SOUTHERN INSPECTION TRIP.

Immediately after the passage of the act providing for the organization of Agusan, the undersigned left on his annual southern inspection trip.

MINDORO.

The first province visited was Mindoro, where good crops and a continuance of good order had produced substantial improvement in material conditions since the time of the last inspection.

CHOLERA IN MASBATE.

A brief stop was made at Mandaon, in western Masbate, where cholera had appeared. The municipal government was found to be paralyzed. The barrios had established an unauthorized quarantine against the center of the town, and the municipal council had held no meeting since the outbreak of the disease. The district health officer, who was on the ground, had been unable to obtain sufficient help to bury the dead. A good supply of disinfectants was left, and a strong effort was made to bring the municipal authorities to an appreciation of their duties.

SAMAR VISITED.

Three short stops were made on the island of Samar, in order to secure information needed for completing the draft of an act for the establishment of a special government for the hill people of that island.

LAND CASES IN SQUIJOR.

The island of Siquijor was visited in order to decide a group of land cases, the bureau of forestry having certified that the land in question was public forest land more valuable for forest than for agricultural purposes, and the claimants to it having stated in writing that it was not forest land at all, but had been under cultivation up to the time of the revolution, when they were forced to abandon it and that bushes had since grown up on it. They maintained that old division lines had been marked and were still plainly visible. As repeated requests for further information resulted only in the repetition of these flatly contradictory statements, the undersigned inspected the land personally, finding that it was virgin forest land. The ignorant petitioners had been misled by an educated sharper, who had promised to secure the land for them on the payment of sums ranging from 10 to 50 pesos each. They did not know the contents of the documents which they had signed. This case is typical of many.

MISAMIS AND BUKIDNON.

The capital of Misamis was next visited, and after a brief conference with the provincial authorities, the undersigned, in company with Lieutenant-Governor Lewis of Bukidnon, set out on a rapid seven days' horseback trip through that subprovince, visiting the settlements of Tanculan, Maluco, Impusungong, Culungsangay, Malabalay, Linabo, Impalutao, Sumilao, Lipayan, Puntian, Camotian, and Nanca, in order more thoroughly to familiarize himself with conditions among the Bukidnon people. After careful consideration the rancheria of Malabalay was fixed upon as the most desirable site for a capital, it being the best-kept settlement of the subprovince and having the additional advantage of being centrally situated.

SURIGAO AND BUTUAN.

Immediately after returning to Cagayan de Misamis our party sailed for Butuan, at the mouth of the Agusan River, in order to get under way preparations for a trip up the Agusan River, and while transportation was being prepared Surigao was visited. After a conference with the authorities of that province we returned to Butuan and, in company with Mr. Frederick Johnson, the newly appointed governor of the province of Agusan, ascended the Agusan and Sumilao rivers for a distance of approximately 160 miles, visiting the municipality of Talacogon and the Manobo settlements of San Vicente, Amparo, Las Nieves, Esperanza, San Islao, Guadalupe, Santa Inez, San Luis, Martires, Clavijo, and San Jose.

GENERAL CONDITIONS IN AGUSAN.

Both in Bukidnon and in Butuan the change in the form of government was explained to the people, and the purpose of the new provincial government to protect them in their rights was made plain to them.

In both subprovinces improvement in conditions should be rapid. Although there are some warlike Manobos in the mountains which form the boundary between Bukidnon and Butuan, and although Moros in the vicinity of Lake Lanao sometimes penetrate into the former subprovince, most of the people of Agusan are peaceful, industrious agriculturists. The Bukidnon produced most of the coffee and cacao, and all of the hemp of Misamis. They are now getting out a considerable amount of gutta-percha. Their country has enormous stretches of level plain suitable for cattle raising on a large scale. It is abundantly watered. The larger streams have cut deeply into the plain, and it is in the ravines or canyons there formed that most of the cacao and hemp are grown. The plain has an elevation of from 950 to 2,750 feet. It has a cool and healthful climate and is capable of supporting a very large population.

In the valley of the Agusan River conditions are very different. There are enormous stretches of level land on both sides of the stream. As a rule, the land in the immediate vicinity of its banks is high, but in many instances it slopes back into swamps. The whole valley is heavily forested and contains much merchantable timber. Conditions are ideal for the growing of abacá (hemp), rubber, and cacao, and coffee would also doubtless flourish.

The river is deep and very free from dangers and with its many branches affords an excellent waterway. Drought seems to be practically unknown in its valley. During our visit, in the height of the dry season, the soil was damp, showers were not infrequent, and heavy river fogs were of nightly occurrence. In spite of the dampness the health of the natives seemed to be considerably above the average.

One of the first measures taken to improve conditions in Agusan should be the construction of a trail between Butuan and Bukidnon. Communication can be had at present only by sea.

WORK ON FISH AND FISHERIES PROVIDED FOR.

In the last annual report of this department attention was called to the need of a systematic investigation of the great undeveloped marine resources of the Philippines. During the year arrangements have been made for beginning such investigation. While the undersigned was in Washington a tentative agreement was entered into relative to securing the services of the United States Fish Commission vessel *Albatross* in Philippine waters for a period of eighteen months. This agreement was later made final, and the *Albatross* should be here and at work early in November, 1907. Meanwhile, the bureau of science has secured the services of Mr. Alvin Seale, who has had ten years' experience in tropical countries, and who is thoroughly familiar with pearl-fishing methods and with the methods employed by the Japanese artificially to provoke the production of pearls.

INTRODUCTION OF BLACK BASS.

Mr. Seale arrived in the Philippines in April, bringing with him a large number of salmon trout eggs and 200 black bass, with a view to the possible introduction of these valuable food fishes into the mountain streams of northern Luzon.

The trout eggs came through in good condition, but unfortunately they reached Benguet, where the hatching experiments were to be made, during the hottest month of the year, when the mean temperature of the water was about 70° Fahrenheit. As a result they hatched very rapidly and the small fry died.

The opinion was freely expressed among experts that it would be impossible to bring young bass alive for so great a distance. Mr. Seale arrived with all but 23 of his bass in vigorous condition, the death of the remainder being due to the accidental leakage of salt water into one of his cans during deck-washing operations. Part of the bass were planted in a small artificial pond at Baguio, and the remainder were placed in a large natural pond in the Trinidad valley and in the Trinidad River. Up to date they are thriving and growing rapidly and the experiment seems to have been a complete success. As soon as they have reached breeding age, the young will be introduced into other ponds and streams.

WORK OF MR. SEALE.

Since his arrival Mr. Seale has spent much of his time with the native fishermen, in order to familiarize himself with the methods used by them and to be able to suggest improvements therein. He has found that the fishes locally known as "bangus," which are brought in large quantities from Mindoro and elsewhere to the provinces of

Cavite, Rizal, and Bulacan, and are raised for market in artificial ponds, may be taken in great numbers at various hitherto unknown points in the archipelago, and that rearing ponds can be readily and inexpensively constructed in many of these regions.

In accordance with his suggestions, an ordinance, calculated to save from destruction the valuable fresh water fisheries on the Butas River in Mindoro, has been adopted by the township of Naujan.

Since his arrival he has obtained no less than 3,181 specimens of fish, which include 631 species, many of which were previously unknown outside of the Philippines, while some 35 are new to science.

POISONOUS FISHES.

The question of fish poisoning has been one of much interest. The number of persons who die annually from this cause is considerable, and as its symptoms closely resemble those of Asiatic cholera, needless anxiety is often occasioned. Mr. Seale cooperated with the bureau of health in an investigation as to the occurrence of poisonous fishes in the Manila markets and six species were discovered which were so actively poisonous that if eaten they cause vomiting, diarrhea, muscular weakness, profound prostration, coma, and death, unless the cases are actively treated.

The bureau of health immediately prohibited the sale of these poisonous species, since which time the number of cases of sickness resembling cholera at Manila has greatly diminished.

BUREAU OF HEALTH.

GENERAL RESULTS.

The results of the work of this bureau during the year have been more satisfactory than those obtained in any previous year since the American occupation. The death rate for the city of Manila was 36.9 to the thousand as against 40.99 for the previous year, while the death rate for Americans was but 5.59 to the thousand, a reduction of 3.75 over the previous year; among Spaniards it dropped from 17.40 to 15.84.

There was not a case of bubonic plague in the islands. More than 2,000,000 vaccinations against smallpox were performed and the effectiveness of the systematic campaign which has been conducted against this disease was clearly demonstrated. Not a single death from it occurred in the city of Manila, and in the provinces of Cavite, Batangas, Cebu, Rizal, Bataan, La Laguna, and La Union, where heretofore there have been approximately 6,000 deaths per year, not one was reported. In the few places in other provinces where smallpox appeared it made little headway.

It is especially gratifying to note the result of the campaign against leprosy; the number of known lepers in the archipelago on September 1, 1905, was 3,580; on June 30, 1907, it was 2,826, a decrease of 654 due directly to the removal from a number of islands of all lepers, and the isolation of the latter at Culion. In the territory thus freed from the disease hardly a new case occurred, and the mortality among lepers being always high the prevention of the spread of contagion has materially reduced the total number of sufferers from this dread disease.

NEW CENSUS OF MANILA.

During January the bureau of health took a census of Manila which showed the population to be 228,542, as against 219,941 given by the official census in 1903. There has been an increase of 18 per cent in the number of Americans, 2 per cent in the number of Filipinos, 14 per cent in the number of Spaniards, and 27 per cent in other nationalities.

The Chinese population has decreased 15 per cent. The figures of this census will hereafter be used in compiling vital statistics but are doubtless materially too low. It was taken at a time when a large number of laborers were absent in the provinces and it is believed that as a result of the suspicion with which the more ignorant class regard all attempts to enumerate them a considerable additional number successfully sought to evade being counted.

CHOLERA.

At the time of the last annual report the bureau of health was busily engaged in combating an epidemic of cholera which was finally brought to an end on November 27, 1906. There were a few cases scattered throughout the year in Capiz and in northern Samar, many of which were never confirmed by a microscopic examination. In the city of Manila there were during the year 848 cases with 744 deaths; in the provinces 7,085 cases with 5,243 deaths. The disease spread slowly by land both north and south. At one time conditions became very threatening in Tayabas, but the epidemic was finally checked in that province when it reached the narrow neck of land between Laguimanoc and Atimonan.

An effective marine quarantine was maintained, and at no time did cholera spread by sea. These results were accomplished with practically no additional expense above that ordinarily incurred in routine health operations.

On July 2, 1906, cholera reappeared at Pasig, and later at Iloilo, on September 18, after the island of Luzon had been free from it for a period of twenty-four days.

BUBONIC PLAGUE.

Since 1903 the bureau of health has been striving to eradicate plague through the isolation of all persons suffering from the disease and the destruction of plague-infected rats.

This policy has resulted in the steady diminution and ultimate disappearance of plague throughout the islands. The following are the figures for Manila: 1903, 160 cases; 1904, 94 cases; 1905, 41 cases; 1906, 20 cases; 1907, no cases. There was not a case anywhere in the archipelago outside of Bilibid Prison, and those which occurred there were the immediate result of prophylactic inoculations against cholera made by Dr. Richard P. Strong with a culture that had previously been contaminated with plague organisms by some unknown person under conditions which strongly suggest criminal intent. Twenty-four developed plague as a result of this inoculation and of these 14 died. A rigid examination was made into this

lamentable occurrence by a technical and a general committee appointed by the governor-general, and the reports of these committees were submitted to the attorney-general for a determination as to whether any responsibility for this occurrence rested on Doctor Strong. Doctor Strong was completely exonerated, it being shown that the serum used by him had been prepared with the greatest care, that he had exercised all due precautions in its preparation and use, and that he was not in the slightest degree responsible for the results of the act of the unknown person above referred to. Although the disease was thus brought into a crowded institution with some 3,500 inmates, it was confined strictly to the persons inoculated with the contaminated culture and a conclusive demonstration of what can be accomplished by modern sanitary science in preventing the spread of plague even under adverse conditions was thus furnished.

BERI-BERI.

There were 403 deaths from beri-beri in Manila as against 378 for the previous year. One death occurred to every 391 Chinese, and one to every 450 Filipinos; there were no deaths from this disease among Americans or Europeans.

In public institutions for the confinement of human beings the decrease in the number of deaths from beri-beri was noteworthy. Less and less difficulty is being encountered in preventing the spread of this disease in jails and other institutions where the inmates are under the direct control of the bureau of health.

TUBERCULOSIS.

Tuberculosis continues to be the most important cause of death among adults in the Philippine Islands. One-sixth of the total deaths in Manila during the year were from this cause. Fairly successful methods for preventing the spread of the disease are well known, but they are exceedingly difficult of enforcement under the conditions which exist in these islands. Improvement can come only through education of the masses, and this will necessarily be a slow process. The bureau of health has issued a bulletin dealing with the subject of tuberculosis in a practical manner, and the facts there set forth are being taught to the children in the public schools.

DIPHTHERIA.

The existence of true diphtheria in the islands has heretofore been a matter of some doubt, but during the year there were reported in the archipelago 10 cases with 8 deaths; the 2 cases which recovered were treated with antidiphtheric serum manufactured by the bureau of science. This serum was not used in the cases which resulted fatally.

TYPHOID FEVER.

There was a decided increase in the number of cases of supposed typhoid fever in Manila, 58 persons dying, as against 45 for the previous year; in less than one-fifth of the alleged cases were the diagnoses verified by laboratory methods.

MALARIA.

From malaria in Manila, 173 deaths were reported, the number being 23 less than for the previous year. In a great majority of the cases the diagnosis was not confirmed microscopically, and it is very doubtful if there really were even this limited number of cases. In the provinces also, there was a marked falling off in deaths from malaria, doubtless due in a large measure to the free distribution by the bureau of health of quantities of quinine in regions where the disease had been most prevalent.

INSANITY.

Conditions as to the prevalence of insanity in the Philippines are very satisfactory; 1 person in every 1,667 is reported insane, as against 1 to every 466 in the United States and 1 to every 304 in Great Britain. The percentage of recoveries among persons admitted to the San Lazaro Insane Asylum has been 19. Of the 3,449 insane persons known to exist in the islands, less than 300 have been cared for in the asylum. Fifty-five thousand pesos have been appropriated for erecting and equipping at San Lazaro a new insane ward with space for 250 additional insane. At the time of writing this report this building is ready to be occupied, so that some additional relief is at hand.

AMOEBIĆ DYSENTERY.

The number of deaths reported in the city of Manila was 344, as against 288 for the previous year. Doubtless this apparent increase has largely, if not entirely, been due to the fact that the disease is now diagnosed with much greater certainty than heretofore. A bulletin on this disease and methods of preventing it has been prepared by the bureau of health for use in the public schools.

DECREASE OF LEPROSY.

Attention has already been called to the encouraging results that have come from the removal of all lepers from a part of the territory of the Philippine Islands. So far as known, there are now none remaining in Simara, Tablas, Sibuyan, Romblon, Mindoro, Negros, Palawan, Cuyo, Samar, Leyte, or Marinduque; fully one-quarter of the territory of the Philippine Islands has thus been freed from leprosy. Comparatively few lepers, in the Philippine Islands at least, die of that disease, but their weakened physical condition results in their falling ready victims to numerous other diseases, and the resulting mortality among them is very high. Experience during the past year serves only to strengthen the belief that if we can prevent the occurrence of new cases through infection, we may rid the islands of this horrible plague in the near future. It was deemed best to carry on the experiment of isolation at Culion somewhat slowly at the outset, in order that wisdom might be gained by experience; the experience has been such that the insular government has now definitely adopted a policy looking to the isolation at Culion of all lepers

in the islands during this and the coming fiscal years. Approximately one-half of the sum necessary to carry out this great work has been appropriated. Much less opposition to the removal of lepers has been encountered than was anticipated. This has, in part, been due to the favorable reports sent out by inmates of the Culion colony as to conditions there; in part, to the fact that microscopic examinations have shown that many persons believed by their friends and relatives to be lepers were suffering from curable diseases and through proper treatment have been restored to society; and, in part, to the fact that the Filipino people themselves, finally recognized the constantly growing menace of leprosy and the necessity for the adoption of radical measures if it was to be successfully combated.

TREATMENT OF LEPROSY BY X-RAYS.

After many vexatious delays the worn-out X-ray apparatus at the San Lazaro Hospital was replaced by a new one, and patients were placed under treatment as follows: November 2, 4; November 3, 3; November 4, 4; November 5, 1; November 6, 6; November 7, 10; and April 30, 1907, 1; total cases 29. In the treatment a regular Gundlach tube was used; exposures were ten minutes in length, at a distance of from 5 to 10 inches, with light enough to give a distinct outline of the bones of the hand and wrist. Treatments were given at first once every three days and later, every second day, the eyes of the patients being protected by suitable shields. Very marked improvement occurred in 8 cases, and considerable improvement in 13; in 7 there was no change, and 1 case died from lobar pneumonia, his death apparently not being in any way connected with the X-ray treatment. Of the 7 cases which show no change, all are in as good health as when treatment began; in several of them the progress of the disease seems to have been arrested. The general health of the 13 persons showing improvement is as good as, or better than, at the time when treatment began. Clinically, the improvement consists in a reduction of the size of the ears and nose, and the disappearance of numerous leprous nodules. With the 8 persons who show marked improvement hypertrophy and infiltrations have almost entirely disappeared and the only evidences of the disease remaining are scars from previous ulcerations, except that several of these persons still have partial contraction of the fingers.

In summarizing these results, the director of health says:

From the foregoing it may be seen that so far at least the X-ray has not proved a specific for the cure of leprosy, yet better results have been obtained than with any other treatment that has heretofore been used, and even if the percentage of recoveries should be no larger than in the past, it would at least offer some hope to individuals afflicted with this disease.

OTHER METHODS OF TREATMENT OF LEPROSY.

Various other more or less widely recommended methods of treating leprosy have been tried, including the use of chaulmooga oil with strychnine. During February the bureau secured a number of bottles of Leprol through the kindness of Dr. Kannosuke Nuyajima, delegate of the Japanese Government to the meeting of the Philippine Islands

Medical Association. Leprol is an oil now being experimented with in Japan; it has been persistently used on two cases at San Lazaro Hospitals, and clinically they are greatly improved, but they still have the bacilli of leprosy in their tissues. The results obtained with Leprol are better than those secured through any other treatment except the X-ray.

VACCINATION AGAINST SMALLPOX.

During the year there were 2,022,380 persons vaccinated by the bureau, an increase of 1,073,255 over the previous year; some 50,000 additional persons were protected by vaccination used by local officials at places where smallpox appeared. Attention has already been called to the fact that in the provinces of Cavite, Batangas, Cebu, Bataan, La Union, Rizal, and La Laguna there were heretofore reported annually some 6,000 deaths and that since the completion of vaccination in these provinces, somewhat more than a year ago, not one death from smallpox has been reported. Is any further argument needed as to the efficiency of vaccination? At the present rate of progress the Philippine Islands will soon be entirely freed from this scourge. The greatest difficulty encountered is that of satisfactorily preserving vaccine matter until it can be used in the more inaccessible parts of the archipelago. The fact that there has been no loss of life nor of any limb, and that there has been no serious case of infection resulting from the vaccination of more than 2,000,000 human beings is sufficient proof as to the care with which the vaccine has been prepared by the bureau of science and used by the bureau of health.

PURE FOOD AND DRUGS.

There has long been a crying need for legislation which would assure the people of these islands more wholesome food and pure drugs. On June 30, 1906, the Congress of the United States passed an act which was designed to secure this result for the people of the United States as well as for the inhabitants of its insular possessions. On November 9, 1906, the governor-general called attention to this act in a proclamation and named certain officials to enforce its provisions, but later, on the recommendation of the attorney-general, who held that the legal machinery provided by the act of Congress was not adequate for its enforcement in the Philippine Islands, a new act, embodying all the provisions of the act of Congress applicable to the Philippines and making only the necessary changes and additions to facilitate its enforcement was passed by the Commission. Active steps for its enforcement could not be taken at the outset, as it was first necessary to secure additional chemists from the United States; such steps will, however, be taken in the immediate future; they are rendered the more necessary by the fact that venders of certain well-known patent medicines who have been driven out of business or compelled to change the formulæ for their remedies in the United States, are now advertising extensively in these Islands, and the more ignorant inhabitants are likely to fall ready victims to their unscrupulous methods and poisonous concoctions.

DEATH RATE AT BILIBID PRISON.

One of the most gratifying results which has attended the work of the bureau of health since its organization has been the reduction of the death rate in Bilibid prison. Up to September, 1907, the prison maintained its own medical staff. Failure to eradicate cholera led to the temporary turning over of the sanitary management of the prison to the bureau of health, and the immediate success obtained in dealing with cholera led to the permanent transfer of the entire work of sanitation and care of the sick in Bilibid to that bureau. At the time this transfer was made, in September, 1905, deaths were occurring at the annual rate of 238 to the thousand; there has been a fairly steady decrease up to the end of the fiscal year, at which time the rate was 13.5 to the thousand. An important factor in this result has been the decrease in crowding, owing to the establishment of the Iwahig penal settlement and the use of prisoners upon public works in the provinces.

PURE-MILK CAMPAIGN.

An active campaign has been inaugurated by the bureau of health for securing better milk for the people of Manila; of 213 samples taken by its agents and examined at the bureau of science, only 131 were found fairly good. Small dealers in many instances frankly admitted that they added water, cocoanut oil, rice flour, sugar, or other substances in order to cheapen the price at which they could sell their milk. They were greatly surprised that any objection should be made to this practice. The city ordinance dealing with this subject is adequate, but on account of the ignorance of many of the vendors it was deemed best first to undertake a campaign of education by having sanitary inspectors explain the law to all of them; this has now been done and hereafter it will be enforced as rigidly as practicable.

THE "PROTECCION DE LA INFANCIA."

While the bureau of health has been waging a campaign against bad milk an organization known as the "Women's Association of Manila" has come to the aid of the bureau and the public by establishing an institution known as the "Proteccion de la Infancia," the object of which is to furnish pure sterilized milk to infants whose mothers are not able to nurse them. This institution occupies quarters which are conveniently near the more populous and poorer districts of the city. It is provided with every modern facility for the proper preparation of milk and competent persons are in charge of the work.

The infants to whom milk is furnished are divided into three classes, namely: those of the very poor, those of the middle class, and those of the rich. To the first of these milk is furnished at 5 centavos per day; to the second, at 30 centavos, and to the third at 80 centavos.

A particularly encouraging feature of this work is that it has been inaugurated and is being carried on by the Filipinos. It deserves and will receive every encouragement and all assistance which the bureau of health, the bureau of science, and the bureau of agriculture can give it. Should it meet with the reception which it

deserves at the hands of the public and receive the financial support to which its importance entitles it, a very material reduction in the present shockingly high infant mortality of Manila should result.

SANITARY SUPERVISION OF RELIGIOUS PILGRIMAGES.

The roads followed by pilgrims in oriental countries have long been recognized as highways for the transmission of disease. Although gatherings of religious devotees do not occur in the Philippines on such a grand scale as in some other parts of the Orient, they nevertheless take place annually at several points in the archipelago. The largest is that at Antipolo, in the province of Rizal, during the month of May, when this little place, which normally has a population of some 2,800, is often called upon to entertain 10,000 or more visitors in a day. It is estimated that during April, May, and June 250,000 persons visit Antipolo and worship at the shrine of Nuestra Señora de la Paz y Buen Viaje. A small village is thus suddenly converted into a large town, which lacks necessary sanitary facilities and sometimes even necessary food. Each year it is necessary to install an emergency closet system and to send a guard of soldiers to prevent the pollution of the drinking water, while careful attention is given to the regulation of the sale of food and drink. During the present year both typhoid fever and dysentery appeared among the visiting thousands, but neither disease spread to any extent.

TREATMENT OF OPIUM PATIENTS.

The opium act provides that a part of the revenue derived from the taxation imposed by it shall be available to pay for the care of victims of the opium habit who may desire to be cured. At the time the law took effect the bureau of internal revenue sent its agents to talk to people known to be addicted to the use of the drug, and informed the director of health that the number of persons desiring treatment would reach into the hundreds. Contracts were accordingly entered into with the San Juan de Dios Hospital at Manila and the Mission Hospital at Iloilo to take care of all applicants. The total number of applicants has been 10. It is to be feared that this indicates that the victims of the habit continue to get the drug without great difficulty.

SANITATION AT THE IWAHIG PENAL COLONY.

Some time after the establishment of the Iwahig penal colony, the officers and convicts sent there began to suffer severely from malaria. Upon the transfer of the control of the sanitation of the settlement to the bureau of health, all persons who were not under the direct control of the superintendent were excluded from the reservation. Each convict was made to swallow daily a prophylactic dose of quinine and to sleep under a mosquito net. All marshy and damp places near the colony were drained, and in a few months the disease practically disappeared. In a short time the average number of sick in hospital dropped from 80 to 15. The death rate per thousand in 1905 was 261; in 1906 it was 118; during the first six months of 1907 it was 25.

A NEW SANITARY CODE FOR MANILA.

During the year an adequate sanitary code for the city of Manila has been enacted. It was highly important that the somewhat miscellaneous aggregation of military orders and city ordinances which had accumulated should be compiled and embodied in a carefully arranged code, so that the citizen might fully understand his duties and the powers of officials might be clearly defined. The new code has been prepared with great care, and its provisions and the necessity therefor are fully described in the annual report of the director of health (Appendix A).

NEW HOSPITAL CONSTRUCTION.

The provision of more adequate hospital facilities at Baguio and in Bilibid prison at Manila, the enlargement of the San Lazaro insane hospital, and the erection of adequate buildings for a general hospital at Manila have long been imperative necessities, and have often been referred to in previous reports of this department. By supplementary appropriation bills during the past year, and by the regular appropriation bill for the fiscal year 1908, these necessities have now been met, the following sums having been made available for the purposes named:

For a general hospital at Manila.....	₱780,000
For a new hospital at Bilibid prison.....	100,000
For an addition to the insane hospital at San Lazaro.....	55,000
For construction of a new hospital at Baguio.....	50,000

The construction of a new hospital at Baguio is particularly opportune at this time when improved transportation facilities will make it possible for a large number of persons to get the benefit of the invigorating Benguet climate while recovering from wasting diseases or recuperating from severe surgical operations.

The new general hospital for Manila will be situated on the exposition grounds in close proximity to the present building of the bureau of science and the new building of the Philippine Medical School which is to be immediately constructed, giving an ideal arrangement. It will be built on the pavilion plan, and will have an administration building, surgical pavilion, nurses' home, 5 wards of 60 beds each, detached ambulance stables, free dispensary, kitchen, and other out-buildings. The original capacity of 300 beds can be increased at any desired time by the construction of additional wards.

A new insane ward at San Lazaro is already completed and in use. It is a substantial fireproof structure of reenforced concrete and proves admirably adapted to the purpose for which it was erected. Its finishings are attractive and it commands a view of a busy street which also serves to attract and hold the interest of patients. It offers very abundant space for 250 insane and could accommodate 350 without serious overcrowding.

IMPROVEMENT OF MUNICIPAL WATER SUPPLIES.

The present water supply of Manila, having more than 10,000 people well within its drainage basin, has been a constant source of anxiety to the health officers, especially during cholera epidemics, and

at such times elaborate and expensive precautions have been necessary to prevent its infection. The drainage basin of the new water supply for Manila is owned by the municipal government, and is, and will be kept, practically uninhabited. The present indications are that water from this new source will be ready for use within a year.

Much has been accomplished in the improvement of the municipal water supplies in the provinces through the construction of artesian wells. Until very recently all municipalities, almost without exception, drew their water from contaminated springs and streams or from shallow wells. The first experimental artesian wells put down resulted most satisfactorily. Fortunately, too, water from these wells is very popular with the natives, who sometimes come ten or fifteen miles to get it.

REDUCED MORTALITY DUE TO IMPROVED WATER SUPPLIES.

The mortality in some of the towns which are now using artesian water largely or exclusively for drinking purposes has already fallen 20 to the thousand as compared with the corresponding period of last year. The demand for artesian wells on the part of municipalities has greatly exceeded the capacity of the well-boring apparatus owned by the government, and the purchase of additional apparatus has been authorized. Provision has also been made by act 1662 for loans by the insular government to municipalities in order to enable them to construct artesian wells.

INSPECTION OF CEMETERIES.

Under existing law the director of health is required to approve all sites for new cemeteries before they can be used, and to determine whether the continuance of the use of old sites shall be allowed. Somewhat stringent regulations on this subject were made necessary by the fact that formerly cemeteries were often established in the very hearts of towns, sometimes even abutting upon the the public plazas. The amount of ground set aside for the burial of the dead was frequently so limited that the digging of every new grave resulted in bringing to the surface portions of the remains of deceased persons previously interred. The duties imposed upon the director of health in the matter of sanitary inspection have proved very onerous, for the reason that warring religious factions have in many instances tried to use the law relative to cemeteries as a weapon of offense. Numerous entirely unfounded complaints as to the insanitary condition of cemeteries have been made with the obvious intention of causing inconvenience to the persons complained against. All complaints have, however, been patiently investigated. There were 582 cemeteries or proposed cemetery sites inspected during the year, of which 272 were approved and 156 rejected, while decision is pending on the remainder.

NEW SEWER SYSTEM FOR MANILA.

The construction of a new sewer system has been actively begun. More than 14 miles of conduits have been laid and 52 miles of street sewers have been contracted for. The 14 miles already laid include

the greater portion of the large-sized sewers, so that much greater mileage may be expected during the coming year.

Completion of new water and sewage systems for Manila will greatly reduce the tremendous odds against which the bureau of health has thus far been forced to contend.

DISCOVERY OF CAUSE OF MOSQUITO PLAGUE IN THE WALLED CITY.

The cause of the mosquito plague in the walled city has at last been definitely ascertained to be in the old underground storm water sewers. During the rainy season the current in these sewers is rapid enough to prevent the mosquitos from breeding and the walled city is quite free from them. During the dry season, however, the current becomes very sluggish and at times ceases entirely. The uneven bottoms of these sewers then retain pools of stagnant water, in which innumerable mosquitos breed. Hereafter until the old sewers can be done away with, the fire department will be requested to flush them periodically during the dry season, and the evil can thus at least be held in check.

TRAINING SCHOOL FOR FILIPINO NURSES.

The bureau of health has entered into a cooperative arrangement with the bureau of education for the training of Filipino women as nurses. The Commission has appropriated funds for 10 free scholarships, and several commercial firms have undertaken to meet the expenses of additional scholarships. The course will be largely practical. At present a small hospital ward has been provided which draws its patients from among the inmates of the girls' dormitory at the normal school. The instruction there given will be only preliminary and will be completed in the civil hospital and in the new general hospital. The importance of this work can hardly be exaggerated. There is no reason to doubt that Filipino women will make excellent trained nurses and the need for a greatly increased number of such nurses is very great.

CIVIL HOSPITAL DIVISION.

In spite of the inadequacy of the present quarters, an immense amount of suffering has been relieved at this institution during the year, and the results obtained have been highly satisfactory. Of the 1,310 patients treated, 818 were whites, 463 Filipinos, and 29 Chinese, Japanese, and other Asiatics. Of this number, only 29 died. Three of these were patients of outside physicians. Eight were brought to the hospital in a moribund condition and their deaths may therefore properly be excluded from the number occurring at the institution, the death rate among the patients treated by the hospital staff being less than 1½ per cent.

More than 8,000 prescriptions were filled and nearly 11,000 dressings were made, while about 1,000 minor operations were performed upon outside patients who presented themselves for treatment.

SANITATION OF BILIBID PRISON.

The satisfactory results obtained during the year in this institution afford conclusive demonstration of the value of both general sanitary measures and detailed laboratory examination. Soon after the bureau of health took charge of this work, a number of structural improvements were made, all drains were deepened and made semi-circular in cross section, the level of the ground inside the institution was raised, and a system of daily sprinkling instituted. Drinking-water barrels were provided with locked covers to prevent contamination. Rigid inspections were made of all latrines. Sick persons were encouraged to come to the hospital upon the appearance of their first symptoms. These measures resulted in reducing the average annual mortality to about 75 per thousand, and there it remained. The prisoners were dying from ailments which should not have killed them, and it was evident that their power of resistance was abnormally low. They received plenty of good food, but suffered from improper nourishment. These facts pointed to some extraordinary drain on their systems. Systematic laboratory examination of the feces of every prisoner in the institution was inaugurated and intestinal parasites were found to be present in about 60 per cent of the cases. Active measures were taken to rid the patients of the resulting debilitating troubles, and the average death rate at once fell to about 20 per thousand. It has since gone down to 13.5. One thousand five hundred and thirty-seven cases of ankylostomiasis were treated during the year, as compared with only 39 cases during the previous year. This does not point to any increased prevalence of the disease but merely demonstrates the importance and efficiency of laboratory diagnoses. Unquestionably this disease is of frequent occurrence throughout the islands, and its presence doubtless accounts for a considerable amount of the "laziness" with which Filipino laborers are charged. Systematic measures for its suppression should be taken.

BENGUET SANITARIUM DIVISION.

The erection of two new sawmills, the installation of mining plants, the increase in road work, and the constantly growing number of visitors at Baguio have greatly augmented the medical work at the Benguet Sanitarium. The Igorots are making more and more use of the hospital, and their sick and injured have been brought to it from many miles around. The number of prescriptions filled increased nearly 56 per cent. Eighty cases of malarial fever, all of which had originated at lower altitudes, were treated with results which were uniformly satisfactory and much better than those which have been obtained in the lowlands. The treatment of amœbic dysentery met with continued success.

The inadequacy of the little hospital building, which was originally intended for a small private dwelling house, created well-nigh impossible conditions, and it was necessary to treat many of the sick in private dwellings or at the hotels. The erection of the new building which will have 30 hospital beds and 6 private rooms, containing one to two beds each, will remedy this difficulty. As the impression seems to have gone abroad that the benefits of the hospitals at

Baguio have thus far been confined largely, if not entirely, to Americans, attention is called to the fact that of the 265 patients treated in the limited quarters available during the last year, 26 were Americans, 2 Europeans, 48 Japanese, and 189 were Filipinos; while the number of outdoor patients, nearly all of whom were Igorots, was 1,371.

The highest temperature recorded at Baguio during the year was 79.5° Fahrenheit, on May 5, and the lowest was 42.4° Fahrenheit, on January 8. The highest mean monthly temperature, 73.62° Fahrenheit, occurred in June. The lowest mean monthly temperature, 48.58° Fahrenheit, occurred in February.

CULION LEPER COLONY.

At the end of the fiscal year there were 739 lepers at Culion. The mortality among them during the year was high, as was to be anticipated from the miserable physical condition of most of them when brought together for removal to the colony. A great majority of them had been public beggars or had existed upon such charity as was voluntarily bestowed upon them. Many were suffering from gangrenous ulcers and from beri-beri. There is no reason to believe that transfer to the colony hastened the death of any of these unfortunates. On the contrary, in many instances life was prolonged or even saved by careful medical attention and good food. Those remaining are healthier, heavier, and generally more robust than when they were received. The deaths by months were as follows:

1906.		1907.	
July	45	January	23
August	48	February	12
September	39	March	13
October	28	April	19
November	36	May	17
December	36	June	23

One case of smallpox occurred, but there was no spread of contagion.

The conduct of the inmates has, on the whole, been excellent, although one crime of violence has occurred. There have been few complaints as to treatment or food, but many of the inmates, especially during the first few weeks after their arrival, have suffered from nostalgia, as was inevitable. All are allowed to roam about the island freely during the day and 18 persons at different times have endeavored to escape. Of these all but 3 have voluntarily returned or have been returned by the authorities.

The most important improvement in the colony has been the establishment of a new gravity water system with a pipe line more than a mile in length, which makes available water enough to meet all present or probable future needs.

SAN LAZARO HOSPITALS DIVISION.

At the San Lazaro hospitals, where smallpox, plague, cholera, and insane patients, as well as lepers, are received and cared for, there were admitted 488 patients during the year, of whom 308 remained on June 30. The cholera and smallpox wards were little used and the plague ward was not used at all.

In the leper department, there were at the close of the year 129 male and 87 female patients. These will perhaps be the last persons transferred to the Culion colony, for the reason that while nearly all of the lepers removed to the colony from the provinces find themselves under greatly improved conditions of existence, this could hardly be the case with those at the San Lazaro Hospital, who would doubtless prefer to remain where they are.

The report of the director of health, Appendix A, is appended hereto. It is unusually full and contains an unusually large amount of valuable information which can not here be even reviewed. The highly satisfactory results accomplished have been obtained at an expense of ₱0.06 per inhabitant; and it is only fair to call attention to the fact that they have been brought about in the face of a vicious, determined, long-continued, and wholly unjustified attack upon the director of health and the work of his bureau, carried on by a large section of the local press during nearly the entire period of the absence of the undersigned on leave. The attack, having failed of its object, ended as suddenly as it began.

In closing this statement of the work of the bureau during the year, I feel that I can not do better than to quote the last paragraph of the report of the director of health, who says:

From a sanitary standpoint the year covered by this report has been a successful one, successful not only because it has been practically free from the devastating influence of epidemic diseases but because of the progress that has been made along the lines of real, effective sanitation. The administration has proved sound from a business standpoint. It is believed that the amount spent this year has produced greater results than any similar amount during any year previous. Lives that have been saved if measured in terms of commercial value would reach an enormous amount, but their value to the body politic, especially when such relation is affected by the conditions of an underpopulated country, is beyond human calculation. Heretofore the best efforts of this bureau have necessarily been expended on Manila and municipalities, not far removed, but as the work has become more systematized it has become practicable to extend scientific methods of sanitation to some of the more remote districts. The importance of the work becomes apparent when comparisons are made with near-by Oriental countries. The conditions for the spread of plague are as favorable in the Philippine Islands as they are in many parts of India where it is raging with great severity. The inhabitants of the Philippines are no more immune to cholera than are the inhabitants of Bengal. Why is it that the country is not decimated by devastating epidemics of smallpox as are certain parts of China? The only available explanation, so far as this office knows, is that eternal vigilance, which is the price of success, has been observed.

The newspapers are not yet through praising the results gained by the sanitary methods adopted by the American Government in Habana during the early part of the American-Spanish war. These measures were indeed successful and the results deserve all the compliments they have received, but it should not be forgotten that they were brought about under very favorable auspices; that the country was under military rule and the orders of the health officer were supported by the prestige of martial law. The Cuban politicians and the opposing press were for the time, silent; sanitation was the order of the day and no excuses were taken, there were no lawyers to contest in court; no restraining orders and no legal obstacles. Large sums of money for sanitary purposes were appropriated in Cuba while in the Philippine Islands only small amounts were available for sanitation. The results here have been brought about on different lines; every effort that has made for progress has been obstructed by meddlesome opposition; and every advance has been sharply contested. Perhaps in the long run it will all be for the best, and the results may be of a more permanent character than if they had been gained with less effort. It has been a campaign of education, patience and persistence.

Reference to the statistical tables in each succeeding annual report will show a steady decrease in the dangerous communicable diseases since American occu-

pation. While they show the success that has been achieved, they do not record the hard work, the discouragements, the faithfulness and efficiency of those to whom the credit is due—the employees of this Bureau—therefore it remains for the Director of Health publicly to acknowledge their part in bringing about what he believes to be a successful issue.

In this acknowledgment the undersigned desires to join.

BUREAU OF QUARANTINE SERVICE.

The quarantine service has been effectively maintained, with the result that no quarantinable disease is known to have been permitted to enter the Philippines, and the spread of cholera by sea has been entirely prevented.

Increased experience seems to show conclusively that in these islands after cholera has once established itself the incubation period of the disease is practically never more than forty-eight hours. The outgoing quarantine detention period was therefore reduced to two days. This has greatly lessened the losses and annoyances necessarily incident to quarantine, without jeopardizing the safety of the islands.

VESSELS DISINFECTED.

Eighty-five vessels were disinfected during the year, with the usual entirely satisfactory result. It is gratifying to note that there is a steady annual decrease in the number of vessels found to be infected with quarantinable diseases. In 1905 there were 28 such vessels; in 1906, 23; and in 1907, 14. This reduction is no doubt due, in large measure, to the systematic vaccination of the crews of all local vessels, which has been continued. The number of cases of sickness from nonquarantinable diseases has also largely diminished, as a result of the constant fight which has been maintained against insanitary conditions in the living quarters of the crews of vessels. When inspection was first introduced skin diseases were found in almost every occupant of the forecabin, and beri-beri was discovered on many vessels. Now, both skin diseases and beri-beri have almost disappeared among the crews.

Owing to the absence of any special health emergency during the year, other than the cholera epidemic, the work of the bureau of quarantine service has been routine work, and any full report of it necessarily takes the form of tables of statistics. Such full report has been made by the chief quarantine officer, and is appended hereto as Appendix B. The undersigned can hardly state the facts more concisely than they have been stated in this report, to which those interested in the further details of this work are referred.

BUREAU OF FORESTRY.

The work of this bureau has progressed satisfactorily, an important factor in the success obtained being the increased familiarity of the foresters with their districts. With two exceptions, each of the foresters has now completed at least two years of service in the district under his charge.

FORESTERS' CONFERENCE.

The custom inaugurated a year since of holding an annual conference of the foresters of the bureau, near the close of the fiscal year,

has been continued with beneficial results. The discussion of important forest problems by men who have worked in different parts of the archipelago, under widely varying conditions, is sure to be helpful. Representatives of the bureau of internal revenue, bureau of lands, bureau of science, bureau of agriculture, and of the Manila lumbermen were present when matters of especial interest to them were under discussion, and thus the practical experience of men in other bureaus, and in private life, was brought to bear on forest problems.

One of the results of this conference was a change in the organization of the bureau of forestry, the division of forest investigation being established in lieu of the division of forest products, and a new division, known as the "division of forest administration," being organized. The division of forest administration, with a force of 6 foresters and some 18 rangers, will take charge of the work pertaining to licenses, violations of the forest act, etc., and will do as much special investigating as possible, in cooperation with the division of forest investigation, which will confine itself to this latter line of work, making special studies and preparing special maps of various parts of the islands.

ABUSE OF FREE TIMBER PRIVILEGE.

It is the concensus of opinion, both of the entire force of the bureau of forestry, and of all other intelligent persons familiar with the facts with whom the undersigned has conferred, that the privilege of free use of timber, granted October 19, 1905, for the period of five years, has been greatly abused; that one of its consequences is to render difficult, if not impossible, the proper safeguarding of the forests by the bureau of forestry, and that steps should be taken to check the abuses which exist. The question is a puzzling one. There is no desire to curtail the privileges of those who wish to secure from the public forests a reasonable amount of timber for private use. But it is not easy to see just how the use of the forests is to be confined within the limits fixed by law, without the enforcement of regulations which will greatly incommode private persons in securing the timber to which they are legitimately entitled.

Relative to this matter, a committee of foresters, directed to report upon the free-use privileges at present confirmed by law, makes the following statement:

It is the opinion of this committee that every home builder in the Philippine Islands should have a similar privilege to that granted settlers in the vicinity of national forests in the United States. There each settler is allowed an amount of timber each year not to exceed a fixed amount, sufficient for his needs, to be used by him in house building, repairs, fencing, etc. To obtain this timber he must apply to local forest officers and remove the material desired from such places, and in such a manner as not to injure the public forests.

A similar right has been granted the Filipino people, but without the restrictions necessary to insure the safeguarding of public interests. The Filipinos may enter any public forest and cut such timber as they desire, without restriction as to amount or sizes. Twelve of the more valuable woods, comprising what is known as the first group, are protected by the present law, but these, as a group, furnish less than one-sixth of the total cut of the islands, and the greater part of this one-sixth is from three to four species, cut in the more inaccessible and thinly inhabited regions. In the thickly populated districts these twelve timbers have almost disappeared, and the bulk of the cut comes from lower group trees. It is from these species of the lower groups that the

future supplies of the islands must be drawn. They are of more importance to the agricultural and commercial development of the islands than the first group timbers.

Rapid economic development depends on cheap construction timbers, and not on fancy woods, or expensive woods suited to special uses. Timber that will furnish the necessary construction timbers for Philippine industrial development is found in the existing forests, but is being rapidly destroyed by the present unrestricted cutting.

We are required to-day carefully to inspect and regulate the cutting of 1,000 timber licensees, whose work is, in the main, satisfactory, and is not materially injuring the forests, and we are forbidden to interfere with the cutting of a population of 7,000,000, of whom one and one-half millions are grown males. These men may enter the forests and cut and waste at will the principal timber resources of the islands.

The bureau of forestry was called into existence to perpetuate the forests by wise use. To give to the people of these islands timber and fuel supplies for all time, and to safeguard its agriculture by caring for watershed forests. Under the present law, the hands of the bureau are tied, and the policy as embodied in this law, allowing the free and unrestricted use of timber, if persisted in, means the ultimate waste and destruction of the islands' timber resources, and a checking of its future economic development.

In view of the shortcomings of the present law, its amendment is suggested. This amendment should contain such part of the following rough draft as, in the opinion of the Philippine Commission, may best protect the public interests and aid in home building:

"AN ACT Amending subsections (b) and (c) of section nine of act Numbered Fourteen hundred and seven, so as to permit the free use of forest products, and providing for the regulation thereof.

"By authority of the United States, be it enacted by the Philippine Commission, That:

"SECTION 1. Subsections (b) and (c) of section nine of act 1407 be, and the same are hereby amended so as to read as follows:

"SEC. 9 (b). Every resident living in or near the public forests, and who is in need of building material, fuel, fencing, or other forest products, stone, or earth, for the personal use of himself, or his family, may, without written permit, enter such public forest as the director of forestry, with the approval of the secretary of the interior, shall designate, and may remove, free of charge, an amount of timber not to exceed fifteen cubic meters in any fiscal year, and such amount of other products as is actually necessary for his personal use. The director of forestry, with the approval of the secretary of the interior, shall prescribe species, sizes, and manner of removal of forest products, stone, or earth, and may, if the public interests demand it, withhold from any individual the right, under this act, to the free use of timber in the public forests.

"(c) The director of forestry, with the approval of the secretary of the interior, may from time to time, set aside certain tracts of public land which shall be known as communal forests, and be assigned to certain communities, whose free use privilege shall be confined solely to these areas, subject to the limitations prescribed in subsection (b). These forests shall be on lands more suitable for forestry than for agriculture, and shall be administered by the director of forestry, with the approval of the secretary of the interior, under such rules and regulations as he may deem wise. The object of the administration of these communal forests shall be to furnish the people having rights therein with the forest products necessary for their home use, and to preserve their water supply. Exploitation of said communal forests for revenue shall be allowed only when the best interests of the forest demand a cutting in excess of local needs. Such exploitation for revenue shall be under license as in other public forests, and forest charges shall be collected in the usual manner and covered into the treasury of the Philippine Islands. These revenues to be returned to the community having rights in the given forest and be devoted, under the direction of the secretary of the interior, acting with the advice of the superintendent of public instruction, to the public education of the community and the improvement and preservation of its forests.

"SEC. 2. The public good requiring the speedy enactment of this bill, the passage of the same is hereby expedited in accordance with section two of 'An act prescribing the order of procedure by the Commission in the enactment of laws,' passed September twenty-sixth, nineteen hundred.

"SEC. 3. This act shall take effect on its passage."

RECOMMENDATIONS OF FORESTERS' CONFERENCE.

The recommendations of the foresters' conference, embodying as they do the results of several years' practical experience, are worthy of careful attention. In so far as they concern administrative matters within the control of the bureau, they may be taken as indicating its policy during the coming year. They are as follows:

1. That the map work be pushed during the coming year in view of its importance at this time. The principal mapping will be the land classification or plot maps. In addition, a beginning will be made in establishing boundaries for possible future reserves. Detailed surveys to be made of a few important cutting areas.

2. That every possible effort be made to assist Doctor Foxworthy, of the bureau of science, by means of data and wood specimens in making a definite key for the determination of Philippine woods.

3. That collections of botanical, wood, and other museum specimens be continued, but made with the least possible expense. That seeds of the important trees be collected, to be used in nursery experimentation work on the Lanao Forest Reserve by Mr. Cuzner, of the bureau of agriculture.

4. That identified railroad ties of the following species be secured and placed in the track, in cooperation with the Philippine Railway Company, in order to secure definite information regarding their durability and fitness for this use: Toog, dao, apitong, amuguís, cubí, banuyo, malaruhát, agoho, supá, palo maria, and banaba.

5. That durability tests of Philippine timbers going into construction work be made whenever possible.

6. That the effort to introduce new species of timber into the markets be continued.

7. That a strenuous effort be made to amend Act No. 1407, so that the free use of lower group timber shall be regulated by the bureau of forestry.

8. That permits be no longer required for clearings on private lands adjoining the public forests.

9. That permits for califins in the public forests no longer be given, and that their place be taken by homesteads.

10. That, in order to encourage the utilization of small logs, which should be removed from the forest, each forester certify to the bureau of internal revenue those timber licensees in his district who can be depended upon to cut small logs without felling trees below the diameter limit imposed.

11. That each forester study the minor products collected in his district and their market value, in order to assist the bureau of internal revenue in imposing a specific tax on those forest products.

12. That efforts be made to introduce American saws, axes, engines, wire cables, and other logging tools.

13. That timber licensees be required to mark their timber in the forest with their own special mark.

14. That exclusive two-year timber licenses be granted to responsible lumbermen when their cutting areas have been mapped and roughly studied by a forester.

15. That foresters inspect personally the cutting areas of large operators, leaving only the inspection of unimportant licensees to rangers.

16. That the foresters make careful observations during the coming year on the influence of deforestation on the climate and waterflow, these observations to be embodied in their next annual report.

17. That the printed forms used by the bureau be amended in such a way as to lessen the paper work of the field force as much as possible.

18. That the Manila office take as much of the clerical work as possible from the district officers, especially in regard to circular letters.

19. That certain forest reserves be recommended as soon as data is at hand sufficient to limit their boundaries, and to justify the request for their reservation.

20. That an educational propaganda be inaugurated; first through the schools; second, by means of stereoptican lectures; third, through the newspapers; and fourth, through general discussion.

21. That in order to arouse interest in Philippine forestry in the United States, frequent articles or reports be sent to the American forestry magazines for publication.

22. That a course of forestry be established in the new Philippine College of Agriculture.

23. That a hand-book of forestry for rangers be completed as soon as possible by the Committee on publication.

24. That the annual conference of Philippine foresters can be assured of having at least one month in the Manila office.

REDUCTION IN GOVERNMENT CHARGES ON TIMBER.

Heretofore there have been two scales of charges on timber, a higher rate being exacted in provinces where forests have been greatly encroached upon than in abundantly forested provinces. With increased ability on the part of the forestry bureau to inspect and control cuttings, the double rate was deemed unnecessary, and by act 1575, enacted January 1, 1907, it was abolished and the lower scale adopted for the entire archipelago. Under it the government charges range from ₱2 to ₱10 per thousand board feet.

FOREST ACT NOT APPLICABLE TO MILITARY RESERVATIONS.

The Philippines forest act does not apply to military reservations. As large forest tracts were included within some of the military reservations in the Philippines, the question as to whether or not forest laws extended to them, naturally arose. The attorney-general of the Philippines rendered an opinion to the effect that the Commission had no authority to extend the forest laws over such reservations. The matter was referred to the Secretary of War for a final decision, and upon the request of the Bureau of Insular Affairs, the Attorney-General of the United States rendered an opinion, in which he held that the Philippine government can not extend its forest laws to United States reservations in these islands.

EFFECT OF NORZAGARAY RIVER IMPROVEMENT ON TIMBER INDUSTRY.

The large stands of valuable timber on the upper waters of the Bayabas and Norzagaray rivers in Bulacan have been made available by the clearing of the channel of the latter river, which was free for the most part, but was obstructed at several points by huge bowlders, rendering its use for the transportation of logs impracticable. The available forest resources of Bulacan have been greatly increased by this improvement.

USE OF PHILIPPINE WOODS FOR RAILROAD TIES.

It has been contended by Philippine lumber dealers that measures should be taken by the government to restrict the importation of railroad ties from abroad and insure the use of Philippine timber for such ties. There would be much force in this claim were private contractors able promptly to meet the needs of the railroad companies and to furnish ties at a reasonable cost. Unfortunately, there is only one lumber concern in the islands at present which is able to furnish ties in large quantities, and unless a sufficient number of contractors to insure an adequate supply will enter the field, and will install modern lumbering equipment, it would appear that a needless and

very unjust burden would be imposed on the railroad companies by compelling them to purchase their ties in these islands, since the rate at which they could carry on rail laying would then necessarily depend directly upon the promptness with which local dealers were able and willing to supply the ties needed.

At the outset the Philippine Railway Company issued a proposition and specifications for ties to be cut in the islands. The question of the practicability of furnishing ties in accordance with this proposition and specifications was deemed to be of sufficient importance to warrant investigation by the bureau of forestry, and a forester was assigned to this work. He reported in substance that while at the outset contracts were made by many licensees, and cutting began with enthusiasm, after eight months such cutting had almost stopped in his district, the contractors having found it a dangerous, and often a losing, business, for three reasons: First, the scarcity of the seven kinds of wood which alone were accepted; second, the severe inspection of ties by the railway company and the lack of a market for rejected ties, and third, the low price offered for such valuable timber in the form of ties. He maintained that other species of timber of probably equal durability should be accepted, that the company should, at least at the outset, be more liberal in its inspection, and that the prices offered were too low to afford contractors a reasonable profit, backing up his statements with concrete illustrations.

The purchasing agent for the Philippine Railway Company, after reading the report of the forester in question, attended the foresters' conference in order to discuss the matter of securing railway material, and his company has agreed to cooperate with the forestry bureau in practical tests of the durability of other woods than those at present accepted. It is hoped that these experiments may demonstrate the suitability of a number of additional species for use as ties and that the installation of improved logging plants by local dealers may make it possible for them to meet the needs of railway companies by furnishing ties in sufficient number and at reasonable prices so that large sums of money now sent out of the country may be retained here.

FOREST MAPS.

The important work of mapping the forested areas of the islands is progressing steadily. On this subject the director of forestry says:

The 10 forest districts of the archipelago are divided into plots of 10 kilometers square and each square given a number. Forest officers use as points of reference the places in the district that have been fixed by the coast and geodetic survey.

Each forester while traveling in his district makes constant use of a topographical notebook, compass, and barometer. A reconnaissance sketch is made on each 10 by 10 kilometer sheet as he passes from square to square. At this time the limits of the forests are noted, also the limits of the cultivated and uncultivated lands, condition of roads, trails, streams, etc. The original sheets thus plotted are sent to the Manila office; copies are retained by each forester. The Filipino forest officers are being tried in this class of work and are making satisfactory progress.

More detailed surveys are made of special forest tracts by an assistant forester, who is a competent topographical engineer. On these tracts careful forest studies are made by a field force consisting of one or more foresters, the rangers of the locality, and the necessary laborers.

These reports are prepared for the special use of prospective logging companies.

PUBLICATIONS OF BUREAU OF FORESTRY.

The following publications have been issued:

Bulletin No. 4. I, "Mechanical tests, properties, and uses of thirty Philippine woods;" II, "Philippine sawmills, lumber market, and prices;" by Rolland Gardner, manager of the timber testing laboratory.

Bulletin No. 5. "Preliminary working plan for the public forest tract of the Insular Lumber Company, Negros Occidental, Philippine Islands," by Foresters Everett and Whitford.

Bulletin No. 6. "Preliminary working plan for the public forest tract of the Mindoro Lumber and Logging Company, Bongabon, Mindoro, Philippine Islands," by Foresters Merritt and Whitford.

Circular No. 1. "Opportunities for lumbering in the Philippine Islands."

The following bulletin will be ready for publication in the near future: "Preliminary check list of the principal timber trees of the Philippine Islands."

The following bulletins are in process of completion: "The first ten timber trees of the Philippine Islands;" "Some Philippine forest types and their commercial possibilities;" "A ranger's primer of forestry."

A second edition of Bulletin No. 4 has been prepared and sent to the director of printing.

REPORTS OF FOREST INVESTIGATION.

The following reports, which add materially to the knowledge of the Philippine forests, have been prepared during the present year:

I. "Report on examination of pine lands, Province of Benguet," by Forester H. M. Curran.

II. "A preliminary examination of the forests of the Kabibihan River basin, province of Tayabas, Philippine Islands," with map, by Forester Wm. H. Kobbe.

III. "Report on forest conditions in the mining region of Aroroy, Masbate, Philippine Islands," with map, by Foresters F. L. Pray and H. M. Whitford.

IV. "An available forest tract in Negros Occidental," with map, by Forester H. D. Everett.

V. "Report on the forests of Danao, Cebu, and timbers used by the Insular Lumber Company," with map, by Forester H. D. Everett.

VI. "A progress report on the investigation of Philippine timbers," by R. Gardner (included in second edition of Bulletin No. 4).

VII. "An available forest tract in northeastern Mindoro," with map, by Forester M. L. Merritt.

TIMBER TESTING LABORATORY.

During the year 11 native timbers and 4 Japanese woods have received a large series of tests. The manager of the timber testing laboratory was, at the request of the secretary of public instruction, sent to Bacolod, Iloilo, Dumaguete, Tagbilaran, and Lucena to inspect

timbers being used in the construction of schoolhouses at these places. There were disputes as to the classes of wood being employed, and the contractors offered to pay all expenses if the bureau of forestry would send a wood expert to examine and report. It proved that in several places inferior woods, not called for in specifications, as well as inferior grades of the woods called for, were being used.

Further details of the work of the bureau of forestry will be found in the annual report of the director, "Appendix C."

BUREAU OF SCIENCE.

The transfer of the division of ethnology to this bureau has already been referred to. From the date of the organization of the ethnological survey, the men engaged in prosecuting it have been confined to temporary and inadequate quarters; first in the district of Malate, later in the Oriente Building, and finally in the building of the bureau of education. It has never had space for the proper care and display of its collections, and especially during the time when these collections were housed in damp rooms on the ground floor of the mint building their deterioration was rapid and serious. Really adequate quarters have now been made available for this division in the building formerly occupied by the bureau of architecture on calle Anloague, and an ethnological museum has been established there which will soon be open to the public.

NEED OF A COMMERCIAL MUSEUM.

In the opinion of the undersigned, provision should be made in the near future for the establishment of a commercial museum and the display of the valuable collections already gathered illustrating the natural resources of the islands—forest, agricultural, animal, and mineral. These collections should be supplemented by reliable and exhaustive information relative to the resources of the islands. This information might be placed on cards and arranged after the fashion of the ordinary card catalogue, and the cooperation of the bureau of education, the bureau of constabulary, the bureau of agriculture, the bureau of forestry, and the bureau of lands should be secured, in order that it might be made as complete as possible. Such a subject as Philippine coals, for instance, should be illustrated by samples from all known deposits supplemented by statements of all analyses of Philippine coals which have been made, the location of coal beds, cost of labor in the several localities, cost of transportation to the sea or to railroads, and especially the results of practical boiler tests. The same principle should be carried out with reference to all other Philippine products.

INCREASED SPACE NEEDED.

In last year's report attention was called to the present overcrowded condition of the bureau of science building. This building was originally planned for the performance of certain definite kinds of laboratory work, and it was and is amply sufficient for this purpose, but there were added from time to time to the original work

of the bureau other lines of investigation calling for work other than laboratory work, and the nature of the services rendered by the bureau of laboratories was ultimately so greatly changed and broadened that it became advisable to rename it the Bureau of Science. Apart from the ethnological collections, for which space has now been provided, the botanical, ornithological, ichthyological, entomological, pathological, geological, and mineralogical collections are all large and extremely valuable, and all are rapidly growing. Many of them are stored under such conditions that they are not accessible for study; much less are they open to the public. Material is available for numerous exhibits which would both entertain and instruct the public, but there is no space available for such exhibits, which are at present stored away in dark places, or, worse yet, are occupying rooms in the bureau of science which were designed and equipped for special lines of laboratory work, are greatly needed for such work, and are not at all well adapted to the storage or exhibition of museum material. The rapid increase in the need of laboratory space resulting from the demands made upon the bureau of science by other bureaus and by the public, from the very large amount of chemical work incident to the administration of the pure food and drugs act, and from the necessity for supplying laboratory facilities to the faculty and advanced students of the Philippine Medical School, makes the necessity for using these rooms for the purposes for which they were designed and equipped very great. It will doubtless be possible for the bureau to get on after a fashion for another year, and, in view of the large appropriations which it was necessary to demand for the new general hospital buildings and the new building for the Philippine Medical School, both of which were imperatively and immediately necessary, the undersigned did not feel justified in asking that the existing congestion in the building of the bureau of science be relieved during the present year by the construction of one of the two wings for this building originally planned. He will, however, urge that appropriation be made for this purpose at the beginning of the next fiscal year.

COOPERATION WITH THE PHILIPPINE MEDICAL SCHOOL.

The establishment of the much-needed Philippine Medical School has very materially increased the work which the officers and employees of the bureau of science have been called upon to perform. No less than eight members of the force of this bureau are also members of the faculty of the school, and the director of the bureau is the dean of the faculty. In fact, it may be said that the school could hardly have been established at this time had not the bureau of science, with its thoroughly trained technical men, its excellent medical library, and its admirable facilities for advanced laboratory work existed.

THE LIBRARY.

The library of the bureau of science, which is the central scientific library of the government, has been largely added to during the present year by purchase from funds appropriated by the insular government and from those derived from the sale of photographs, as

well as by exchanges received for the Philippine Journal of Science, and last but by no means least, by the receipt of valuable donations secured through the activity of the librarian. The library now comprises some 25,000 volumes, exclusive of about 2,000 trade catalogues and 600 maps. Although intended primarily as a reference library, 3,848 volumes have been allowed to go out during the year to responsible and duly authorized borrowers. With the establishment of a new medical school, the use of the library is rapidly increasing.

DIVISION OF BIOLOGY.

The discovery made by members of the bureau of science force that many persons in Bilibid prison were suffering from animal parasites, some of which caused fatal and others wasting diseases, led to the authorization of a section of animal parasitology, which was filled by the appointment of Dr. Philip H. Garrison, detailed from the United States Navy. Important results have already been obtained by him.

In addition to the regular work of the division of biology, a large amount of valuable research work of a practical nature on tropical subjects has been completed. The nature of this work will be found fully set forth in the report of the director of the bureau of science, Appendix D.

SERUM DIVISION.

On January 1, 1907, care of the herd of animals used in the manufacture of antirinderpest serum was transferred to the bureau of agriculture. As soon as the necessary buildings can be completed, the herd will be moved from the San Lazaro estate to the Alabang stock farm, where the availability of a large amount of good pasture land will greatly reduce the cost of maintaining it.

Under the present arrangement, employees of the bureau of agriculture bleed serum animals and separate the serum from the clots. It is then shipped in sterilized 5-liter bottles to the bureau of science, where it is centrifugated, filtered, tested as to sterility, and bottled ready for shipment.

In the past, large quantities of serum have been lost through contamination by organisms during the dry season, when the air is constantly full of dust from the city streets. Filtering of the serum did not prove feasible, as filters promptly clogged. Fortunately it has now been discovered that by centrifugating the serum and subsequently filtering it this difficulty is overcome. All serum is now treated in this manner and losses from contamination are avoided. A new apparatus has been ordered, which, it is hoped, will make it possible to centrifugate the blood without waiting for the formation of clots. This should increase the yield of serum sufficiently to save the cost of the centrifuge in about a year after its installation.

The serum division has furnished antidiphtheritic and antitetanic serum, cholera prophylactic, plague prophylactic, and mallein as required. It will soon have ready for distribution the serum for bacillary dysentery and that for typhoid fever.

All efforts to isolate the organism causing rinderpest have thus far resulted in failure, but it has been absolutely proved that the infectious material in the blood of animals suffering from this disease will not pass through the Berkefeld filter. In other words, the

filtrate from this blood is harmless when injected into a nonimmune animal. Objects large enough to be stopped by such a filter ought to be visible under the highest powers of the microscope if properly stained, and it is hoped that it may ultimately prove possible to isolate and cultivate the organisms causing this disease. Were this possible the cost of producing antirinderpest serum would be very greatly reduced, as the necessity for perpetuating the disease by constantly transferring from one nonimmune animal to another would be obviated.

BOTANICAL DIVISION.

Important results were obtained by Mr. Merrill, chief of this division, on an expedition organized by Maj. Gen. Leonard Wood, which ascended Mount Halcon in Mindoro.

Eight thousand, seven hundred and forty-nine sheets of local material and 7,226 sheets of foreign material have been added to the herbarium during the year. A large series of wood samples has been collected, properly identified and labeled, with herbarium specimens to accompany them, and the task of identifying Philippine timbers has thus been rendered much less difficult. Several thousand determinations of wood specimens have been made for the bureau of forestry and during the last five months of the year the work of the timber-testing laboratory at Bilibid Prison has been conducted by an employee of the botanical section of the bureau of science.

ENTOMOLOGICAL SECTION.

The most important work of the entomological section during the year has been practical investigation as to the sources of malarial infection at various points in the islands, with the recommendation of measures calculated to end such infection, and the successful introduction of silkworms.

ZOOLOGICAL SECTION.

Field work has been pushed during the year by the working force of this section and a large amount of valuable museum material has been secured. Two important exchanges of specimens have been arranged with other museums and a considerable amount of material has been sold for cash.

FISH AND FISHERIES.

The employment of Mr. Alvin Seale has been referred to elsewhere in this report, and the services rendered by him since his arrival have been briefly outlined. In addition, it should be stated that he is rapidly pushing the work upon a catalogue of fishes, which contains the native, English and scientific names of each species known and such information as is available as to where and at what season it is to be found, where its eggs are deposited, how its young develop, what food it requires, methods of capture and preservation and its market value, as well as suggestions as to future investigations, if such investigations seem likely to yield profitable results. In connection with this catalogue, an identified collection has been started which already

numbers some 3,200 specimens and represents approximately 630 species, 35 of which are new to science.

Mr. Seale has also found the valuable "sheep's wool" sponge of commerce in Philippine waters.

CHEMICAL DIVISION.

During the year it has been found necessary to divide the chemical laboratory into 2 sections: A section of general analytical work and organic chemistry, and a section of weights and measures and mineral analyses.

SECTION OF GENERAL ANALYTICAL WORK AND ORGANIC CHEMISTRY.

The routine work of this section has greatly increased. Approximately twice as many analyses as were made during the previous year have been required. A detailed account of the work performed will be found in the annual report of the director of the bureau of science, "Appendix D." Among other important practical results obtained may be mentioned the demonstration by Doctor Richmond of the practicability of applying the sulphite process in the preparation of paper pulp from hemp waste and Philippine grasses. Mr. Richmond has not only demonstrated that excellent paper can be prepared from cogon grass, bamboo, hemp waste, and from a number of Philippine woods, but has furnished reliable data as to the cost of erecting a paper mill, the expense of operating it, including the outlay necessary for the importation of chemicals, and has considered the availability and cost of the several raw materials above mentioned. The field for the establishment of an important paper manufacturing industry in these islands has thus been fully prepared. As one result, hemp waste, which was formerly thrown away, is now being purchased and exported in considerable quantities, the exportations from Manila for the period covered by this report being 515 tons valued at ₱40,166.

SECTION OF WEIGHTS AND MEASURES AND MINERAL ANALYSES.

Act No. 1519 of the Philippine Commission, regulating the inspecting and sealing of weights and measures, took effect during the year and the work of standardizing has begun. All weights, measures, and instruments of precision which have gone, or are to go, to the provinces to serve as secondary standards have been compared, and measuring flasks have been marked.

The charge for assay work has been reduced, not because the original charge was unreasonable, but because it seemed desirable to stimulate the development of our infant mineral industry by giving miners an opportunity to have assays made practically at cost. The present charge for a gold assay is ₱2. As a result, the number of assays made has increased more than 200 per cent. The number of coal analyses and of calorific determinations has also increased, owing to the interest being taken in Philippine coals. It was 75 as compared with 15 for the previous year. These figures do not include the work done for the division of mines or for other bureaus of the government, or for purposes of research, but represent that performed for private individuals for pay. Doctor Cox has shown that Philippine coals

can be successfully used in the manufacture of producer gas with resulting greatly increased efficiency; and in order to afford a practical demonstration of the value of this process and to reduce the cost of fuel used by the bureau of science, the Commission has made appropriation for the establishment of a producer gas plant for that bureau.

DIVISION OF MINES.

On July 1, 1906, Mr. H. D. McCaskey, formerly chief of the division of mines, went on leave to the United States. Owing to ill-health he subsequently resigned without returning to the islands. Mr. Eveland resigned on January 15 of this year; and Mr. Ickis was absent on leave from August 2 to February 22, so that from July to September there was but one man in the field. The work of this division has therefore been greatly handicapped. Mr. Smith was, however, able to visit north Ilocos and to investigate the asbestos and manganese deposits in that province. In December he began the large undertaking of making a geologic map of the coal regions of Compostela and Danao in Cebu. In January, Mr. Goodman joined him to aid in this work. He has since made a reconnaissance of Mount Pinatubo in Zambales province and of the region in its vicinity. When Mr. Ickis returned he was immediately dispatched to Camarines to make a preliminary inspection of the gold region in the vicinity of Paracale and Mambulao. From there he went to the island of Polillo to inspect the coal workings; thence overland from Infanta to Manila.

Mr. Ferguson, who took Mr. Eveland's place, has spent a large amount of time in petrographic work and has carried on field work in the Batanes Islands and the island of Camiguin in the Babuyan group, the results of which will shortly be published.

It is proposed in the future to abandon the former policy of minute, detailed and expensive surveys of particular regions, which, while of great scientific value, do not cover a sufficient amount of territory to insure the making, within a reasonable time, of a reconnaissance of the geology of the Philippine Islands. The work at present planned is: (1) Geological reconnaissance work; (2) the investigation of economic materials, chiefly of fuels and materials for construction; (3) statistical work; (4) mapping.

It is proposed to issue at the close of each calendar year a statistical bulletin on the mineral resources of the Philippines, showing fully the results obtained during the year and the value of the business done.

BUREAU OF LANDS.

There has been a great increase in the demands upon this bureau, and although the number of employees has been increased from 316 to 637, it has been found impossible to keep up with current work.

FRIAR LANDS.

Administration of the Friar estates has been considerably hampered by political agitation in connection with the recent election for assemblymen; tenants have been assured that the coming assembly would deliver over the Friar lands to the occupants thereof free of

cost. By the more unscrupulous agitators they have been told that war was about to break out between the United States and Japan; that the Japanese would take possession of the islands; and if the payment of rents were delayed it might be avoided altogether. Tenants who believed either the one or the other of these statements were naturally reluctant to pay their rent, but notwithstanding these disturbing influences the greater part of all estates devoted to rice culture is now occupied and leased. The portions formerly planted in sugar are practically abandoned owing to a variety of causes. Most of this land has remained uncultivated for ten years and is covered with a dense growth of vegetation which can be removed only by hard work and at large expense. The scarcity of draft animals renders cultivation of such land impossible for many tenants. Mills, machinery, and warehouses were in many instances burned during the war or allowed to fall into a ruinous state; tenants have not sufficient funds with which to meet these conditions, and are unable to borrow, except at ruinous rates of interest; and finally, under existing conditions as to markets available there is little encouragement to grow sugar.

Another source of difficulty has been encountered in the decisions of justices of the peace as to who were the bona fide occupants in possession of Friar lands at the date of purchase by the government. The object of the government in purchasing the Friar lands was to get them into the hands of the actual tenants, many of whom were, and are, very poor. Unscrupulous persons of means who desire to gain control of large tracts of the choicest lands, attempt to establish the fact of occupation before justices of the peace, and, being represented by adequate counsel, very frequently win cases which they ought to lose, the tenants who are thus cheated out of their rights being too ignorant or too poor to employ adequate counsel or to appeal their cases to the higher courts.

All the estates have been registered under the mortgage law in the provinces where they are located. The San José estate has been registered under the land registration act, and the Matamo, San Marcos, and Dampol estates are now before the court of land registration; other estates will be entered as fast as surveys are completed and the necessary information on which to base an application for registration is available.

In the report of the director of lands will be found a tabulated statement showing the progress made on each estate in leasing lands, the current expenses, the nonrecurrent expenses, the receipts, and the deficit for the year ending June 30, 1907.

There has been an increase of 3,459 leases, covering a total area of 6,207 hectares. The increase in the revenues collected for the year amounts to ₱127,966.33; the cost of administration for the purposes included in last year's report has increased but ₱1,964.79. The expenses of irrigation, however, have increased ₱11,006.52, owing to the employment of ditch tenders and laborers to keep the system in better condition. The expenses of surveying during the year were ₱206,489.18, an increase of ₱122,924.55, this difference being caused by the fact that more surveyors were employed, in order that the surveys might be completed as soon as possible.

Important repairs to irrigation works on the estates have cost ₱13,861.96. During the coming year the expense of administration

will probably be somewhat reduced, but the expense of irrigation will remain practically the same.

The extraordinary, or nonrecurrent expenses for surveying and drafting will be increased during the year, but it is expected that the work of surveying will be finally completed before July 1, 1908.

LEASES AND SALES OF FRIAR LANDS.

The leases first issued to the tenants on Friar estates were for periods of one year only, one of the main objects in issuing such leases being to secure an acknowledgment of the government's title by the occupants. At the outset it was usually necessary to accept the statement of each lessee as to the number of parcels occupied by him and the area of each such parcel. As surveys have progressed and the real number of parcels occupied by lessees, with the true area of each, has been ascertained, old leases have been canceled and others executed in their place. In the large majority of cases it has been found that the lessees greatly understated the amount of land which they were occupying. Frequently the excess amounts to 100 per cent or more, and the increase in the total rental is considerable. Malicious persons have circulated the report, which has been generally believed by the ignorant, that the government was increasing the rate of rental, which is not true. Many lessees have refused to take out new leases covering the true amounts of land occupied by them, claiming that they are absolutely unable to pay the increased charge. At the same time they have demanded that the lands be sold to them at once. The rental is approximately 4 per cent of the purchase value of the land occupied. If the lands were sold to the tenants they would, under existing provisions of law, have to pay 10 per cent of the full value annually and in addition thereto 4 per cent on deferred payments, which would amount to far more than they are now paying. If the claims of tenants that they can not pay the rents due are true—and it is known that many of them are substantially true—it is evident that they would be still less able to pay the purchase price in 10 annual installments.

It is the opinion of the director of lands that it will be impossible, except on a few of the smaller estates, to carry out the provisions of act No. 1120, by selling parcels of land in the manner now provided by law. Tenants would have to pay annually from 4 to 6 times the amount they are now paying as rental. The director of lands therefore urgently requests that act No. 1120 be so amended as to extend the time of payment to thirty years, so that the bureau of lands may make contracts with tenants to suit their financial condition, thirty years to be the maximum term of payment for any parcel of land, and deferred payments to bear interest at 4 per cent per annum. This would increase the total interest paid, but would reduce the amount of annual payments to such an extent that the tenants should be able to make them; yet, even on this basis, the annual payment per hectare would be about double the annual rental now charged.

In the report of the director of lands will be found a detailed estimate of the approximate amounts of readily saleable land on each estate. The total sale value of all estates, excluding improvements, as fixed by law, was on June 30, 1907, ₱14,337,400. The director of lands estimates the aggregate value of the saleable land on the same

date to be ₱10,239,500. The government, therefore, has approximately ₱4,000,000 invested in land which is not readily saleable, either through its being wild land or, as in the case of the San José and Isabela estates, on account of lack of occupants.

The value of all irrigation systems and other improvements on the estates is approximately ₱1,000,000, so that the government has invested some ₱5,000,000 in property which for some time to come will neither be sold nor produce any great amount of revenue, and which costs annually at least ₱200,000 in the form of interest on bonds.

EXTENSION OF CULTIVATED AREAS ON FRIAR ESTATES.

Cultivated areas on the occupied estates are being increased, but the process is slow, owing to the fact that tenants lack capital for purchasing draft animals, seed, farm implements and machinery. The director of lands believes that under existing conditions ten years will elapse before as large an area is brought under cultivation as was cultivated prior to 1895. The difficulty is especially great on estates formerly given over largely to sugar culture. The director of lands suggested the loan to tenants of funds to be used in paying the cost of cultivating their land, on mortgages covering growing crops and salable commodities manufactured therefrom, and on work animals, warehouses, mill houses, machinery, and other property, both real and personal, situated on the Friar estates. The insular auditor, the director of agriculture, and the director of lands were instructed, by resolution of the Commission, to prepare an act covering this subject and a carefully prepared plan was submitted to the Commission, together with an act for carrying it out. The Commission has made available ₱100,000 to be used in demonstrating the practicability of the working plan adopted, which will be found set forth in detail in the report of the director of lands.

IRRIGATION SYSTEMS ON FRIAR ESTATES.

The sum of ₱25,000 has been expended by the bureau of engineering and public works for the restoration of irrigation works on the estates in La Laguna and Cavite provinces. These irrigation works are now in fair condition and are furnishing all the water required. During the coming year ₱60,000 will be expended in repairs to important dams and tunnels, and further extensive repairs should be unnecessary for some time to come. The insular government will retain ownership of the irrigation system and it is believed that when the area of each person's holdings on irrigated estates is known, sufficient fees can be collected to maintain the irrigation works and cover the interest and sinking fund on the capital invested in them.

RAILROADS ON FRIAR ESTATES.

Two lines of railway, which are rapidly approaching completion, cross the estates of Muntinlupa, Biñan, Santa Rosa, Calamba, Imus, San Francisco de Malabon, Santa Cruz de Malabon, and Naic, as well as the 2 estates in the province of Cebu. These roads will furnish much needed facilities for transporting crops to market; will open areas hitherto practically inaccessible, and should increase the value of the estates and the returns derivable therefrom prior to the date

of sale. The railroad companies will pay for lands occupied by them, as provided in the Friar lands act, and have already settled with many of the tenants for damage done to their improvements.

DETAILED STATEMENT OF CONDITIONS ON EACH FRIAR ESTATE.

A detailed statement of the conditions on each of the estates as regards leased areas, surveys, cultivated areas, and agricultural conditions in general, will be found in the report of the director of lands (Appendix E).

PUBLIC LANDS.

During the year employees of the bureau of lands, bureau of education, and bureau of forestry and officers of the constabulary, have aided the bureau of lands in a concerted movement for the dissemination of knowledge relative to public lands among the common people. The bureau of lands has distributed more than 20,000 circulars and has kept 3 agents in the field to explain the laws, assist in the preparation of applications, inspect lands, and investigate contests. As a result, the number of applications for land has greatly increased, the total being 12,029, as compared with 3,392 for the entire previous period, or since October 7, 1903. Of these, 2,669 were for homesteads; 8,607 for free patents; 86 for sales; 12 for leases; 136 for coal claims; and 519 for mineral claims. A full account of the operations under each one of these heads will be found in the report of the director of lands.

HOMESTEADS.

The average area of homesteads applied for has been a trifle more than 11 hectares, which is doubtless far more than the average man will be able to cultivate. Not all homestead applications have been bona fide. Applications are filed for parcels of land which the applicants sell to whoever will purchase them, after raising 1 or 2 crops. In other cases they cut the timber on the land applied for, without any intention of perfecting title to the homestead. In some instances they even use their homestead entries as roving commissions to cut valuable timber anywhere in the vicinity, and when they bring such timber to market, declare that it has been cut on the land described in their entries, in order to avoid payment of government charges. "Caciques" have obliged those dependent upon them to apply for land under the homestead law, with a view to getting actual control of such land from the outset, and to ultimately acquiring title to it at a nominal cost. Much patience is necessary in dealing with these conditions, but it is being exercised and the people are gradually being instructed.

Taking the average area of a homestead at 11 hectares, the director of lands estimates that the cost of the survey made by the government is 3 pesos per hectare, and that the average cost of clerical work and investigation during the five years before the entry can be allowed will make the total cost to the government for each homestead entry perfected and surveyed approximately 50 pesos, for which it will receive in return 20 pesos in fees, leaving the net cost to the government for each perfected homestead application approximately 30 pesos.

SALES OF PUBLIC LAND.

The 86 sales applications received during the year covered an area of 2,697 hectares. The total sales applications from the passage of the public land act (October 7, 1903) to date have numbered 168, covering an area of but 4,987 hectares. Of these only 152 proved to be bona fide. Three were for an area of less than 1 hectare each; 24 for areas varying from 1 to 5 hectares; 40 for areas of from 5 to 16 hectares; and 52 for 16 hectares only. Thirteen were from corporations, and averaged 267 hectares each.

AN AMENDMENT TO THE PUBLIC LAND ACT NEEDED.

Under the present law individuals and corporations are restricted to the purchase of 1 tract only of public land each. Basing his opinion on past experience, the director of lands believes that both individuals and corporations should be allowed to purchase as many contiguous tracts as they may desire, provided the total area purchased does not exceed the area which may lawfully be sold to a corporation or individual. The undersigned fully concurs in this view. The advantage of so amending the law as to admit of such purchases would be that an applicant would purchase such a tract as he could at the time afford, and after it was brought under cultivation and his resources were increased could extend the limit of his holdings. It is believed that the classes of people and of corporations who would take advantage of such a provision are those which would assist materially in the development of the agricultural resources of the country, and no objection to it is seen.

LEASES OF PUBLIC LAND.

Only 12 lease applications for a total area of 5,921 hectares were received during the year; 10 had previously been received, making a total of 22, which cover an area of 12,279 hectares. Six of these applications, for 3,798 hectares, have already been withdrawn, and the balance are in various stages of progress. Lack of surveyors has greatly delayed the execution of leases.

FREE PATENTS TO NATIVE SETTLERS.

Eight thousand six hundred and seven free patent applications were received during the year, as against 730 for the entire previous period since October 7, 1903. The average area applied for is 3½ hectares. Of the total number of applications received, 1,061 have been rejected, canceled, or withdrawn; 6,775 are ready for survey and investigation, and the balance are in various stages of completion.

Act No. 1573, enacted December 13, 1906, extended the time within which free patent applications could be made. The director of lands objected to such extension, and in his annual report renews his objection to further extensions, for the reason that in his opinion practically all property holders outside of the non-Christian provinces who could comply with the provisions of this chapter have been in possession of their lands a sufficient length of time to avail themselves of chapter 6 relative to unperfected titles. The director of lands

seemingly overlooks the fact that the non-Christian peoples constitute approximately one-eighth of the total population of the Philippines; that, in most cases, they remain entirely ignorant of the provisions of the land law until these provisions are verbally explained to them; and that they are, in nearly all instances, unable themselves to make out their applications, so that it would seem that they are entitled to fairly liberal treatment.

The director of lands estimates the cost to the government of each free patent survey at 10 pesos, and the cost of investigating the right of an applicant to such patent, the clerical work in relation thereto, and the issuance of the patent at 20 pesos. If these figures are correct, each free patent issued will cost the government 30 pesos. It must not be supposed from the fact that 6,775 applications are pending investigation and survey, that any such number of free patents are likely to be granted. It is practically certain that hundreds of the applicants have no right to avail themselves of the provisions of this chapter.

TOWNSITES.

Up to the close of the last fiscal year the Baguio townsite was the only one which had been surveyed—2,995.38 hectares being added to this townsite reservation during the year—making the total area 5,595 hectares, or 21.6 square miles. A third subdivision of lots has been surveyed and platted, and will soon be placed on sale. Most of the persons who purchased lots at the second sale were in no way connected with the government, which fact has a bearing on the statement so often made that Baguio would be used only by government officers and employees.

Camp John Hay, the Baguio military reservation, has recently been increased in size by executive order of the President.

Six additional townsite reservations are now receiving the consideration of the bureau of lands. Of these, 4 are in the Moro Province, one at Olongapo, in Zambales Province, and one at Sibul Springs, in the province of Bulacan.

UNPERFECTED TITLES.

Notice of 367 applications presented to the court of land registration, by persons desiring the benefits of chapter 6 of the public land act, have been received by the bureau of lands. Investigation of each of these cases has led the bureau to request the attorney-general to enter appearance in 128 cases and opposition in 54. In the opinion of the director of lands, the applicants in the other cases were entitled to the registration of their property, or the land involved was not of sufficient value to warrant opposition by the government. Experience has shown that rigorous investigation is necessary where applications cover very large areas of land. In many instances efforts are made to secure very extensive tracts to which the applicants have not the shadow of claim.

MINERAL AND MINING CLAIMS.

One hundred and thirty-six new coal entries, covering an area of 8,156 hectares, have been recorded, in addition to the 150 entries, covering 9,139 hectares, filed previous to this fiscal year, making the

total entries 286, covering 17,295 hectares; but 143 entries that were pending action at the close of the previous year were canceled, as the applicants failed to complete their entries within the year. This serves strongly to emphasize the recommendation made in the last annual report of the undersigned that applicants be allowed two years in which to complete their entries, on account of the great delay resulting from imperfect means of communication and of the difficulty in securing expert investigation.

Of the entries filed during the year, 18, covering 1,052 hectares, are now undergoing survey. Two have been perfected and patents issued. It is believed that a number of others will be perfected during the year.

There were 427 lode claims and 92 placer claims filed during the year, and prior to the beginning of the year there were filed 1,174 lode claims and 441 placer claims, making a total of 1,601 lode claims and 533 placer claims filed up to June 30, 1907.

In the report of the director of lands will be found a table showing in each case the kind of claim, the mineral, and the province where located.

Twenty-one applications for survey have been received. These surveys are nearly completed and patents will presumably issue immediately.

SURVEYS.

Seventeen thousand one hundred and sixty-eight parcels of land, with a total area of 68,573 hectares, have been surveyed, at a cost of ₱211,563.69. The average area of each parcel surveyed was approximately 4 hectares; the average cost was approximately ₱3.08 per hectare.

The large cost of surveys is the direct result of the small size of the parcels. In spite of the large amount of work done, the bureau is badly behind with its surveys. A considerable increase in the surveying force has been authorized.

On the Friar estates, 62,239 hectares have been surveyed during the year, making a total of 95,528 hectares surveyed to date, and leaving unsurveyed 63,144 hectares.

The cost of surveying Friar lands has ranged from ₱0.52 to ₱7.31 per hectare, the average being ₱3.09.

The difficulties encountered in making Friar land surveys are most graphically shown in the report of the director of lands by the submission of a map of the Orion estate, which covers an area of 901 hectares, and is divided into 651 lots. Reference to this map will show that many of these lots have very numerous corners, and most of them have banana, bamboo, mango, or other trees or rice stacks along their boundaries, so that any attempt to change these boundaries, or introduce a system of rectangular surveys, meets with vigorous objection on the part of the tenants. This condition of things makes surveys far slower and more expensive than would be the case if a rectangular system could be employed.

Only 2 regular parties have been kept in the field on public land surveys during the year. One consisted of a high-salaried, experienced American surveyor and an American transit man; the other of a Filipino surveyor and Filipino transit man. The average cost per hectare of the surveys made by the first party was ₱1.71;

that of the surveys made by the second party was ₱2.91, showing that experienced men, although high-priced, accomplished their work at lower cost per hectare than did men with less experience, who received materially lower salaries.

SAN LAZARO ESTATE.

The entire San Lazaro estate has been subdivided into 116 blocks, exclusive of the hospital reservation. Seventy-three blocks have been surveyed and subdivided into building lots; 10 have been partially subdivided; 22 blocks suitable for building purposes remain to be surveyed and subdivided; and 11 blocks are so situated that the lands are only suitable for agricultural purposes.

All efforts to secure from the city proper drainage, adequate water supply, street lighting, sanitary arrangements, and the improvement of streets, have ended in failure. The attitude of the municipal government seems to be that it will spend no funds on improvements in this district, for the reason that the government does not pay taxes on the property. A number of blocks, otherwise suitable for residences, are at present absolutely unapproachable during wet weather. In view of the fact that the insular government is doing all of the health work for the city, and is caring for numerous insane, leprosy, and other helpless residents, an effective remedy would readily suggest itself. Unless the city adopts a more reasonable attitude in this matter, the undersigned recommends that the remedy be promptly applied. In this connection, it should be noted that the income from the San Lazaro estate is devoted to charitable purposes, being expended for the care of lepers and of persons suffering from other dangerous communicable diseases, so that even were this estate not in the hands of the insular government, it would still not be subject to taxation.

At present 2,629 of the lots on this estate are occupied. Two hundred and seventy-seven tenants occupying 425 lots, were added to the rent roll during the year. There has been material improvement in the general character of the buildings on the estate. Many of the old houses have been repaired and enlarged, and the erection of twenty buildings of strong materials, and 149 of light or mixed materials has been authorized.

The total rentals derived from the estate were ₱53,467.37, as against ₱50,243.75 for the preceding year, an increase of a little more than six per cent.

The delinquent rent roll on June 30, 1907, amounted to but ₱2,339.59, most of which is probably collectible.

The director of lands recommends that all lands which the Commission has ordered reserved in this estate for the extension and improvement of streets be formally conveyed to the city of Manila, free of cost, but with the provision that the municipality shall within the next two years, at its own expense, establish a good street system, the total cost of which will not be less than the assessed value of the lands so conveyed. The undersigned concurs in this recommendation.

The annual report of the director of lands, submitted herewith (Appendix E) covers very fully the operations of his bureau for the year, and much of the important information will be found submitted in concise, tabular form.

BUREAU OF AGRICULTURE.**PERSONNEL.**

The bureau of agriculture has been shorthanded throughout the year. Its former director, Mr. W. C. Welborn was granted leave of absence with permission to visit the United States on account of illness, and sailed from Manila on March 19, 1907. He had been in bad health for some time prior to his departure, and failure to recuperate in the United States as rapidly as had been hoped subsequently caused him to tender his resignation. The assistant director, Dr. George E. Nesom, who was also serving as chief of the division of animal industry, was therefore compelled to perform the additional duties of director during the last three and one-half months of the year. Upon Mr. Welborn's resignation he was made director, but no assistant director has as yet been appointed.

LOSS OF VETERINARIANS.

The taking effect of the meat inspection law in the United States and the subsequent greatly increased demand for veterinarians has resulted in the loss of nearly the entire veterinary force employed by the bureau a year ago, only three of the old men remaining. Five veterinarians have been induced to come out from the United States to fill vacancies, but a considerable additional number is urgently needed.

AGRICULTURAL INSPECTORS.

Six agricultural inspectors authorized in the appropriation bill for the fiscal year 1907 arrived during November and December, 1906, and after a preliminary period of instruction were assigned in January to their several stations. They have all rendered valuable service, especially in dealing with animal diseases. It is essential that those who are sent to suppress outbreaks of infective animal diseases should arrive on the ground promptly, and the undersigned is of the opinion that the number of employees should be so increased that there would be at least one veterinary inspector, or assistant inspector, for each province in the Archipelago. In view of the difficulty of securing competent veterinarians, it is believed that early consideration should be given to the question of the advisability of establishing here a veterinary school.

INCREASED EFFICIENCY OF FILIPINO EMPLOYEES.

The director of agriculture reports that his Filipino clerical force is steadily increasing in efficiency, and as a result of satisfactory service rendered a number of Filipino clerks heretofore temporarily employed have been given permanent appointments in the classified service.

SUPERINTENDENT OF AGRICULTURAL EXTENSION WORK.

It has long been the opinion of the undersigned that the bureau of agriculture was failing to get sufficiently closely in touch with the people, and that as a result some of its efforts were misdirected while

the results of others, although of great importance if generally known, were failing to reach those who should most largely profit by them. It is highly important that this bureau should direct its efforts toward the solution of problems which are of practical importance to the people, and that the results of this work, when successful, should become known promptly and widely. With a view to remedying this difficulty to some extent, the former director of agriculture was instructed to prepare for and hold a series of "farmers' institute" meetings in the more important provinces. This proved impossible on account of the shortage of officers and employees, and for other reasons. This plan will, however, be carried out when the working force has been recruited up to such a point as to make it possible. Meanwhile, it was believed to be desirable to provide a position which might be filled by a Filipino of known experience and ability, who would on the one hand familiarize himself with the practical results obtained by the bureau and make them known to the people, and on the other would keep the bureau more closely in touch with public needs. The position of superintendent of agricultural extension work was accordingly created in the appropriation bill for the fiscal year 1908, and was at once filled by the appointment of ex-Governor Pablo Tecson of Bulacan Province, who, through his practical knowledge of agricultural matters, had already been able to render the government very valuable service as a member of the central equalizing board, one of whose duties it was to fix the proper rates of taxation on agricultural lands.

PUBLICATIONS.

The following publications have been issued:

Title.	Author.	Issued.	Language.
FARMERS' BULLETINS.			
No. 13: Cultivation of maguey in Philippine Islands (reprint).	H. T. Edwards.....	Aug. 27, 1906	English.
No. 14: El cultivo del sesamo en Islas Filipinas..	Wm. S. Lyon.....	Aug. 29, 1906	Spanish.
PRESS BULLETINS.			
No. 8: Maguey, propagating abaca from seed, etc.	H. T. Edwards.....	Nov. 9, 1906	English.
No. 9: Bureau of agriculture districts of the Philippines, control of rinderpest, etc.	G. E. Neson.....	Feb. 5, 1907	Do.
No. 10: The weevil pest and its remedy, maguey, etc.	H. T. Edwards.....	Apr. 24, 1907	Do.
No. 10: La plaga de gorgojos y su remedio, maguey, etc.	.....do.....	.....do.....	Spanish.
CIRCULARS.			
Instructions for planting field and garden seeds.	Wm. S. Lyon.....	July 19, 1906	Spanish.
Maguey.....	H. T. Edwards.....	July 27, 1906	English.
Do.....	.....do.....	.....do.....	Spanish.
Do.....	.....do.....	.....do.....	Ilocano.
Do.....	.....do.....	.....do.....	Tagalog.
Do.....	.....do.....	Sept. 12, 1906	Boholano.
Maguey (reprint).....	.....do.....	.....do.....	Tagalog.
Do.....	.....do.....	.....do.....	Spanish.
Maguey.....	.....do.....	Nov. 8, 1906	Maabate.
Do.....	.....do.....	Apr. 24, 1907	Cebuano.
No. 1: Crop Report Service.....	.....do.....	Nov. 11, 1906	Spanish.
Do.....	.....do.....	.....do.....	English.
Instructions for planting seeds (reprint).....	Wm. S. Lyon.....	Mar. 19, 1906	Spanish.
Maguey (reprint).....	H. T. Edwards.....	May 16, 1906	English and Spanish.

Since the close of the fiscal year, a popular bulletin on kapok has been issued, and a similar bulletin on dangerous communicable animal diseases is ready for the press. The highly gratifying results which have followed the publication of the original maguey bulletin and the efforts of the bureau of agriculture to stimulate the cultivation of this valuable fiber plant, have led to the hope that the pursuit of a similar policy designed to increase the production of kapok, corn, rice, pineapples, cacao, and sesamum may lead to similar results.

CROP REPORTS AND STATISTICS.

The statistician provided for in the appropriation bill for the fiscal year 1907 was appointed and assigned to the duty of organizing and supervising the crop reporting service throughout the islands. He recommended the division of the archipelago into agricultural districts, with a corps of municipal, provincial and district reporters, the latter to be regular agricultural inspectors, and to have general supervision of the work of all reporters in their respective districts, each reporter to furnish a monthly and an annual report on the agricultural conditions within his municipality, province, or district; abacá, maguey, sugar, rice, copra, and tobacco being the crops to be regularly reported upon; live stock also to be reported on, with special reference to the occurrence of diseases. Unfortunately, Mr. B. L. Moss, who was appointed statistician, was disabled by amebic dysentery, and compelled to leave the service. Pursuant to the policy outlined by him, the bureau of agriculture has established nine agricultural districts as follows:

District No. 1.—Includes Cagayan, Isabela, and Nueva Vizcaya. Headquarters, Tuguegarao; substation, Ilagan.

District No. 2.—Includes Ilocos Norte, Ilocos Sur and Union. Headquarters, Vigan; substations, Laoag, and San Fernando (Union).

District No. 3.—Includes Pangasinan, Benguet, Lepanto-Bontoc, and Tarlac. Headquarters, Dagupan; substations, Baguio, Cervantes, and Tarlac.

District No. 4.—Includes Zambales, Bataan, Pampanga, Nueva Ecija, Laguna, Rizal, Manila, Cavite, Batangas, Tayabas (part on west coast), Mindoro, Palawan, Marinduque, Romblon, and Bulacah. Headquarters, Manila; substations, Iba, Linao, San Fernando (Pampanga), San Isidor, Batangas, Lipa, Lucena, Santa Cruz (Laguna), and Alabang.

District No. 5.—Includes Camarines, Albay, Sorsogon, Masbate, and Tayabas (part on east coast). Headquarters, Legaspi; substations, Nueva Cáceres, Sorsogon and Masbate.

District No. 6.—Includes Samar and eastern Leyte. Headquarters, Tacloban; substation, Catbalogan.

District No. 7.—Includes Cebu, Negros Oriental, Bohol, Misamis, Surigao, Agusan, and western Leyte. Headquarters, Cebu; substations, Tagbilaran, Dumaguete, Cagayan and Surigao.

District No. 8.—Includes island of Panay and Negros Occidental. Headquarters, Iloilo; substations, Silay, La Carlota and Capiz.

District No. 9.—Includes Moro Province. Headquarters, Zamboanga; substation, Davao.

The reports received were at first few in number, and more or less unsatisfactory in substance. In view of the fact that municipal and provincial reporters were for the most part inexperienced in such work and served without pay, this was to be anticipated.

On June 30, 1907, 370 municipal reporters were representing 308 municipalities, and a total of 1,628 reports had been received. The character of these reports is steadily improving, and they should

soon afford sufficient data to justify the publication by the bureau of agriculture of a consolidated monthly crop report.

An especially important feature of this work is that it gives the bureau a large number of reliable agents throughout the provinces to whom bulletins and reports can be sent and who will aid materially in bringing the results of its investigations to the attention of the common people.

SEED AND PLANT DISTRIBUTION.

Interest in seed and plant distribution steadily increases, and the amount of seed and plants sent out has far exceeded that of any previous year. Applications for farm seeds proper were 42 per cent of the total applications, as against 20.5 per cent for the previous year and this change in the nature of the applications was especially gratifying. The distribution of sesamum, Carolina golden rice, peanuts, field corn, and maguey were the most important made. At its Singalong station the bureau for the first time succeeded in raising seed corn that was in all respects fully up to the standard type procured from the United States. A part of the sesamum seed was donated by M. Edouard Vidal of Manila. Seeds and plants were sent to 3,078 different persons, in 519 different towns or settlements, and reached every province in the Archipelago.

DISTRIBUTION OF MAGUEY.

The introduction and distribution of Hawaiian sisal plants, the issuance of publications on maguey by the bureau of agriculture, and the personal efforts of its agents, have given a tremendous impetus to the cultivation of this valuable fiber plant in the provinces which have well-drained soils and where a prolonged dry season renders the cultivation of abaca impossible. The Hawaiian plants first introduced are now coming to maturity and are yielding a high percentage of excellent fiber and the demand for additional plants is greatly in excess of the supply. The first lot of 50,000 was received in July, 1906, and these were distributed in 8 provinces. The second lot of 50,000 arrived in August, 1906, and were distributed in 18 provinces. The third lot of 120,000 was received in November, 1906. Of these 15,000 were sold to the Moro Province at cost, 10,000 were furnished the bureau of lands for distribution on Friar estates, 5,000 were planted at the Lamao experiment station of the bureau of agriculture and the remaining 90,000 were distributed in 33 provinces. Provincial governors, teachers, and other responsible persons have aided in the distribution and it is known that a total of 37 provinces and 196 municipalities, including 502 individuals, have received Hawaiian maguey plants. Doubtless the ultimate distribution of these plants has been much more widespread than these figures would indicate. The total requests for maguey plants at the end of the year numbered 1,342, and came from 43 provinces and 381 municipalities. In order to meet the increasing demand, half a million poll plants were ordered in February, 1907, from the Hawaiian agricultural experiment station, to be delivered in Manila during July and August.

Not only has Hawaiian maguey been introduced upon the above-outlined extensive scale, but active measures have been taken to

facilitate the securing of plants of Philippine maguey by those who desire to start plantations. While this latter variety produces a lower percentage of fiber than does that from Hawaii, the fiber is longer, finer, and of good strength. Great difficulty was experienced by farmers in obtaining young plants in sufficient numbers. The bureau of agriculture therefore took the matter up, systematized it, and has arranged to secure several million poll plants as they are required. The policy followed as regards distribution is as follows:

Hawaiian plants are distributed in comparatively small lots, free of charge, the purpose being ultimately to provide seed plots in all the provinces. Native plants are furnished in small lots, free of charge; but when desired in commercial quantities, are furnished at ₱1.50 per thousand, which represents the approximate cost to the bureau. Seed beds for growing young poll plants until they are of suitable size for distribution have been started at the Singalong station in Manila and at the Lamao forest reservation on the west side of Manila Bay.

GENERAL FARM CROP SEEDS.

Experience has been highly satisfactory with broom corn, field corn, cowpeas, velvet beans, kaffir corn, sorghum, rice and sugar cane. Cotton, teosinte and new varieties of tobacco and peanuts have been sent out, but sufficient reports have not been received to justify definite conclusions. Barley and oats have been found to be useful as forage plants only at high altitudes. Alfalfas and clovers have done well at high altitudes, but have invariably died out in the lowlands, even where soils were inoculated with the specific nitrogen producing bacteria called for by each species.

GARDEN VEGETABLE SEEDS.

Unqualified success has been reported from every province except Samar with beans, beets, cabbages, carrots, eggplant, mustard, okra, peppers, radishes, parsley, New Zealand spinach, tomatoes, and turnips. The reports relative to sweet corn, American cucumbers, melons, watermelons and squashes, have ranged all the way from "very good" to "complete failure," the losses, except in the case of corn, being due to attacks of insect pests. Brussels sprouts, rhubarb, and French artichokes have proved very unsatisfactory. Asparagus has almost invariably flourished. Kohlrabi of excellent quality and size has been grown by the bureau experimentally and is deemed worthy of wide distribution. Celery has made a good growth, but has rusted when attempts were made to bleach it. American pease, if planted so as to mature during the cooler months, invariably fruit, but do not produce as abundantly as could be desired at low altitudes. In the highlands of Benguet they bear heavily. Some edible podded Japanese varieties raised experimentally have given heavy crops in the lowlands, and will be widely distributed.

ORNAMENTAL FLOWERING PLANT SEEDS.

Heretofore the bureau has not distributed seeds of this class, but latterly a small concession has been made to the constant demand for them, and amaranthus, balsam, calendula, calioptis, cockscomb, mari-

gold, portulacca, zinnia, nasturtium and ageratum seeds have been sent out in limited quantities. All but the last 2 species have given excellent results.

NEW DEVELOPMENTS IN SEED DISTRIBUTION.

Two noteworthy developments in seed distribution have been the greatly increased number of small farmers applying in person for seeds, and the largely augmented number of requests for seeds from the provinces of Samar and Leyte, which seems to indicate that the restoration of peace in these provinces is being followed by renewed interest in agricultural pursuits.

STEAM PLOWING.

In November, 1906, a large steam plow owned by the bureau was shipped to the Santa Rosa Friar estate, with a view to its use in plowing lands formerly cultivated in sugar but subsequently abandoned and covered with a dense growth of rank native grass and brush, so that it was almost impossible to break them up with ordinary farm animals and small native plows. The soils on which it was desired to use this plow were for the most part black in color, fine in texture, and very pasty when wet. The attempt was made to use a gang consisting of six 14-inch share plows of the sandy-land type, but, as was feared, it would not turn the black sticky soil. An 8-disk steam gang of the orthodox type was then tried. This worked fairly well in sandy land, which was comparatively free from grass and rubbish, but proved a failure in heavy soil which was badly overgrown. Two experimental gangs carrying 8 and 12 disks respectively, and each provided with a middle breaker were then constructed on special plans. The larger of these was designed to be pulled by a 35-horsepower engine, and the smaller by one of 18 horsepower. The latter gang proved to be too heavy until 2 of its disks were removed, after which it worked well. The heavier gang was a success from the start. Most of the dry season was consumed in these experiments, but they were necessary in order to devise a form of plow suited to the soil conditions encountered.

A number of other difficulties have been encountered in steam plowing for private persons. It was arranged that landowners should furnish labor, water, and fuel, the latter to be dry wood. The places where plowing has been done have usually been distant from houses, and laborers have been late in arriving. Animals for hauling wood and water have been scarce, and the available supply of dry wood has often been exhausted speedily. These facts serve to emphasize the necessity for more careful preliminary preparation by landowners who desire to have steam plowing done for them.

The manufacturers of a petroleum plowing engine, which, if successful, would obviate fuel and water difficulties, and which is lighter and consequently more readily transported than any steam plowing engine, have offered to send one of their outfits on approval, the government to pay the cost of forwarding and returning the same in the event that it does not prove satisfactory. This offer will probably be accepted. Ten thousand pesos are available for continuing experiments in plowing with traction engines, and the use of other mechanical devices for cultivating the soil.

ANIMAL INDUSTRY.

EFFORTS TO IMPROVE DOMESTIC ANIMALS.

The bureau of agriculture has continued to furnish a number of American stallions, jackasses, bulls, and boars to the provinces for breeding purposes. The results obtained have varied widely and have depended largely on the interest displayed by the persons having the animals in charge. In some instances, fine stallions have stood idle with hundreds of mares within easy reach of them. On the other hand, an Arab stallion in a remote mountain district has served 62 mares, and 2 stallions kept in direct charge of the bureau have served 75. Ten others have had a total of only 91 services. The groundless fear that native mares would be injured in foaling colts sired by larger horses has continued to exert a bad influence in spite of the demonstrated facts. Evil-disposed persons have circulated rumors that enormous stud fees would be charged, or that part of the colts sired would be taken in payment for the services of the stallions. The greatest difficulty encountered has been in the presence of numerous scrub native stallions, which got at mares soon after foaling, so that many of those brought in for service are found to be again with foal. In spite of all difficulties, a number of excellent colts have been reported. At present, the plan of fencing in pastures where mares can be brought before foaling and kept until after again got in foal, is being carried out with good results.

The demand for American and Australian bulls steadily increases, and the results obtained from those already sent out have been uniformly good. A fine lot of young bulls are now being raised and after being immunized to rinderpest will be distributed throughout the more important cattle breeding provinces.

An outbreak of hog cholera reduced the herd of Berkshire pigs to 6 sows, and temporarily checked their distribution. The herd is now being rapidly brought up again and distribution has been renewed.

The Angora and Maltese goats are flourishing, and the demand for these animals is greatly in excess of the supply.

RINDERPEST.

The energies of the division of animal industry have been largely directed toward holding in check this disease, which has appeared at one time or another during the year in the majority of the provinces. The policy at present pursued is to combat it at all points where it appears by the use of serum only. This practice has the advantage that it immediately checks the disease in any given locality, is not attended with any loss due to the inoculation, and even results in the cure of a very large percentage of the animals diseased at the time of inoculation. It is, of course, very popular with cattle owners. The drawback is that the immunity produced is of a temporary nature, and after two or three months animals which have received only serum inoculation become again susceptible to rinderpest, although if attacked they suffer less severely than do those which have not been immunized.

The simultaneous method of inoculation in which blood from a diseased animal and serum are administered at the same time, confers permanent immunity, and can be effected with a very low percentage of loss, if the animals inoculated are not suffering from surra and are properly cared for while undergoing treatment. The neglect of owners who sometimes even leave them without drinking water while under treatment and the complications which have arisen through the occasional unsuspected presence of surra, have led to so many difficulties, that it has been deemed advisable to confine inoculations by this method to animals under treatment at regular quarantine stations except in special cases.

In repeated instances rinderpest has been introduced into provinces which had previously been entirely free from it, through the importation of diseased cattle. The need of an effective quarantine law which would give the bureau of agriculture power to penalize and prevent the shipping of animals suffering from dangerous communicable diseases has long been apparent, but as in the case of all sanitary measures, such a law could not be of practical value until the state of public sentiment justified its enactment. On October 10, 1907, it was believed that this time had come, and an act to prevent the introduction into the Philippine Islands of dangerous communicable animal diseases, to prevent the spread of such diseases within the islands, and for other purposes, was passed by the Commission.

Several especially valuable practical demonstrations of the value of inoculation by the simultaneous method have been afforded in the provinces, where animals thus immunized have remained well while nearly all others about them sickened and died. There is now a strong demand for the animals permanently immunized at the serum laboratory, and a private cattle dealer has recently announced his intention of establishing extensive yards and going into the business of permanently immunizing and selling cattle. The highly satisfactory results obtained in checking rinderpest in badly infected herds brought to Manila for slaughter, and in saving the animals already diseased, have been especially appreciated by the public, and it seems not too much to hope that serious popular opposition to cattle inoculation, due to ignorance or superstition, is now decidedly on the wane and that the most serious difficulties in the way of protecting the horned cattle of the Philippines from rinderpest have been overcome. At all events, the demand for serum has been greatly in excess of the available supply and more immunization work could therefore not have been done no matter how great the demand for it. Arrangements have now been made materially to increase the supply of serum, the unexpended balance of the Congressional Relief Fund having been made available for this purpose, and effective means of preventing infection by dust during the dry season have been devised, so that its keeping properties have been greatly improved and the danger of abscesses following inoculation seems to have been completely done away with.

HOG CHOLERA.

Hog cholera has been reported from nearly every province in the islands. It has not been practicable to pay much attention to this disease, as efforts to combat rinderpest have taken the almost exclusive attention of the small force of veterinarians available.

GLANDERS.

Two thousand eight hundred and sixteen horses have been examined for glanders, of which 87 were found to be infected. This disease is prevalent throughout the islands, and owing to the widespread belief among the natives that it is incurable, little headway has been made in controlling it. Municipal authorities have as a rule been willing to do nothing more than temporarily quarantine infected animals; those which had the disease in acute form have died, while those in which it became chronic have been allowed to go at large and infect others.

SURRA.

Surra has been less prevalent than during the previous year. Nevertheless, there have been serious outbreaks in several provinces.

FOOT AND MOUTH DISEASE.

There has been no serious outbreak of this disease.

DISEASES OF FOWLS.

Diseases of domestic fowls have been reported from nearly every province. The principal ailments were chicken cholera and a parasitical affection of the skin of the head, which often results in total blindness and subsequent death. Many thousands of chickens and turkeys have died monthly in the provinces where this disease has been prevalent.

NEED OF VETERINARIANS.

The facts as to the prevalence of animal diseases serve strongly to emphasize the necessity for a greatly increased force of veterinarians in these islands, and it is believed by the undersigned that this need may best be met by providing for the education of Filipinos in this most important branch of medical science.

CATTLE INSPECTION AT MANILA.

A full account of the extensive cattle inspection operations carried on at Manila, and of their results, will be found in the annual report of the director of agriculture, "Appendix F."

SERUM HERD.

The management of the serum herd was turned over to the bureau of agriculture on January 1, 1907. It was hoped that this herd could be transferred to the Alabang stock farm before the end of the year, but delay in the erection of necessary buildings made this impossible. At the time the herd was transferred it included 60 serum bullocks. This number has been increased to 107, and it is still impossible to supply the demand for serum.

ALABANG STOCK FARM.

A new stock farm has been established on the Muntinlupa Friar estate, 22 kilometers south of Manila, on the west shore of the Laguna de Bay. It can now be reached only by lake steamer, but

the grade for the new Batangas line of railway which passes just in front of the farm is being rapidly completed, and communication by train will soon be established. This will greatly facilitate the shipment of milk to the government hospitals at Manila.

This new stock farm contains 240 hectares of land, all of which is available for cultivation or pasture. Conditions as to soil and water supply are most satisfactory. Five wooden buildings have already been erected, and a dairy barn for 50 milk cows, sheds for 150 serum bullocks, a quarantine station, and a superintendent's house, a shed for Maltese goats, an implement shed, and quarters for laborers, will be erected at the close of the rainy season.

There are now at the farm 122 head of cattle, 20 head of horses, 26 Maltese goats, and a herd of Berkshire pigs. The Maltese goats were imported during the year. Elaborate precautions, which resulted in complete success, were taken to avoid the introduction of Malta fever. Four males and 14 females arrived in good condition at Manila. Five died shortly after their transfer to Alabang, from eating a poisonous vine. The remaining ones have flourished, and at the end of six months after arrival the herd numbered 28, in spite of the early loss of 5 breeding animals. Some of the best goats give 5 to 8 pints of milk per day, and it is hoped that their introduction may ultimately lead to a material relief of the existing shortage in the supply of fresh milk.

GENERAL CONDITION OF STOCK AT ALABANG.

All the stock at the Alabang farm has kept in excellent condition, although taken there during the dry season and fed very little grain. The calves dropped on this farm are the best ever raised by the Bureau.

TRINIDAD STOCK FARM.

This farm, in the highlands of Benguet, was opened during the closing months of the last fiscal year. It has fairly good soil, is provided with adequate buildings, and has a fairly good water supply. Some of the pasture land is rough and a certain amount of fencing is necessary to insure against danger that animals will injure themselves by falling. Of the 400 hectares of grassland connected with this farm, probably 25 per cent are inaccessible to large domestic animals. The pasture is poor on the hills during the dry season, and the animals at present on the farm have taxed it. Additional land in the neighboring Trinidad Valley will soon be fenced. This land is too wet for use during the rainy season but will be very valuable during the drier months.

STOCK ON HAND AT THE TRINIDAD FARM.

At this farm there are 2 imported stallions, 14 imported mares, 20 native mares, 5 yearling colts, 9 suckling colts, 6 jack burros, 11 jennets, 3 imported bulls, 3 grade bulls, 1 imported cow, 47 native cows, 6 grade steers, 23 grade heifer calves, 17 bullocks, 1 Berkshire boar, 2 grade boars, 1 grade sow, 4 Angora goats, and 8 sheep, making a total of 185 animals. The remarkable freedom from disease enjoyed by the animals on this farm has caused it to be used for carrying on experiments in horsebreeding, and as a safe plan for keeping animals likely ultimately to be required for breeding purposes in the lowlands.

The results of the breeding operations carried on at this place will be found fully set forth in the report of the director of agriculture, "Appendix F." A question of immediate importance which suggests itself in connection with the Trinidad farm is the improvement of the pasture land, and the raising of forage crops. Teosinte does not do well at this altitude. Oats when sown on well-manured land produce a heavy growth of green fodder, but ripen very little seed. Bermuda grass is now growing in many parts of the Trinidad Valley and is readily transplanted. It keeps green during the dry season when most other grasses wither. Plats of it will be started at various points on the farm.

Guinea grass raised from roots sent from Manila is flourishing. At Manila it produces numerous very heavy successive crops of excellent green forage, and should it do equally well in the Trinidad Valley could be grown on the moist lands during the dry season, and might furnish an adequate solution for the forage difficulty at this time. Clover grows luxuriantly under irrigation.

FARMS ABANDONED.

The stock farm at San Juan del Monte was abandoned in favor of the new one at Alabang, where conditions are much more favorable.

A small rice farm of 25 hectares on the Santa Cruz Friar estate was also abandoned. The land had been broken by plows hauled by a petroleum traction engine and an 18 horsepower steam traction engine, both of which the bureau was testing, and the rice was threshed with an ordinary rice thresher. The operation of this machinery was interfered with by people whose superstition had in some way been aroused by unscrupulous persons. As the sole object of establishing this farm was to afford a demonstration of the advantages of steam plowing and threshing, there seemed no reason for continuing it.

MACHINERY INVESTIGATION.

The hemp-cleaning machine invented by Mr. Welborn, the former director of the bureau, has been considerably improved and enlarged. One of the perfected machines has been sent to the provinces, and 10 more have been contracted for. Unfortunately, the first machine to go into the field was placed in the hands of incompetent persons, who apparently made very little effort to keep it clean or in adjustment. It proves to have a capacity of some 450 pounds of dry fiber per day of eight hours, when operated and supplied with petioles by inexperienced men. The undersigned saw this machine in operation. The fiber delivered by it was not well cleaned, the obvious reason being that the cleaning knives were badly out of adjustment. The capacity of this machine in the hands of competent persons yet remains to be determined.

Some efforts on the part of the bureau of agriculture to perfect machinery for ginning kapok have not led to any important results. Meanwhile, a local firm has introduced a cotton gin modified so as to adapt it to cleaning kapok, which delivers 1,500 pounds of well-cleaned fiber per day, and requires eight horsepower for its operation.

Three makes of cylinder rice hullers and polishers have been tried, but the results have not been satisfactory. The conclusion has been reached that burr hullers are better adapted to present conditions in the Philippines than are the more modern cylinder hullers.

The bureau has continued its effort to meet the great need in these islands of a maguay cleaning machine of small weight and comparatively low cost, and has at last obtained success. The so-called "Pioneer" machine was imported from the United States. As received, it proved highly unsatisfactory, but certain modifications were introduced, which have given it a capacity of 10,000 to 12,000 leaves per day. It cleans the fiber thoroughly, and saves a large percentage of it.

DIVISION OF PLANT INDUSTRY.

The work of this division includes all general plant investigations, laboratory and field tests of seeds, and the work of plant introduction and improvement carried on at the Singalong experiment station at Manila, the Lamao forest reserve in Bataan Province, the La Trinidad farm at Baguio, Benguet, the sugar farm at La Carlota, Occidental Negros, and the coffee farm at Lipa, Batangas.

The results of this work are fully set forth in the report of the director of agriculture, "Appendix F," and only the most important can be referred to here.

GROWING ABACA FROM SEED.

There has been much difference of opinion as to whether abaca could be successfully and profitably grown from seed for starting new plantations. The bureau of agriculture has been able to answer this question in the affirmative, and has grown seedling plants averaging 3 feet 6 inches in height in six to seven and one-half months. These results were obtained at Manila under very unfavorable soil and climatic conditions.

KAPOK.

Attention has been called in previous reports to the unfortunate waste of this valuable fiber in the Philippines, where the people were ignorant of its value. The bureau has successfully continued its efforts to educate the people on this point, and to secure a market for the product. Planting is now progressing on a considerable scale.

EXPERIMENTS IN SEED PRESERVATION.

Great difficulty has heretofore been encountered in preserving seeds, which lose their vitality with extraordinary rapidity during the rainy season, and experiments have been conducted with a view to remedying this difficulty. Great success has been obtained by placing seeds in a jar on top of a layer of coarsely broken and thoroughly dried charcoal, covering them with a second layer of charcoal, gently heating the jar to expel all remaining moisture, and then carefully sealing it. A jar thus closed on December 23, 1906, was opened on May 23, 1907, and of 100 seeds taken at random 91 germinated. From a jar that had been merely hermetically sealed at the same time only 28 per cent germinated.

GUINEA GRASS.

Twenty roots of this grass from Honolulu which arrived in good condition, were propagated by the division and have grown very successfully. Half a hectare is now planted with it at Singalong, and many plants have been shipped to the provinces. It gives a very

heavy yield of tender succulent forage which is greedily eaten by horses and cattle. Three cuttings have been made from the original plants with no symptoms of exhaustion.

A NEW PHILIPPINE VELVET BEAN.

The successful introduction of the Florida velvet bean has previously been reported. Subsequently, an undescribed species of native velvet bean, to which the name "*Macuna lyoni*" has now been assigned, was discovered in the province of Pampanga. Three seeds were obtained which weighed 2 grams, and from then 7 $\frac{1}{16}$ kilograms of seed were grown, the 3 plants being stimulated in every way to a maximum production. Subsequent field tests alongside the Florida velvet bean show that the Philippine species is the more productive. It has now been grown to the third generation, is losing the woodiness of its main stem, and continues very prolific. It has the advantage over the Florida velvet bean that its fruit is palatable for human beings. Samples of the seed have been furnished the bureau of plant industry of the United States Department of Agriculture for field tests in the Southern States. This is a soil-renovating plant and its discovery is a matter of no little importance.

CAROLINA GOLDEN RICE.

This rice sown in drills 18 inches apart and cultivated much like corn, with no artificial irrigation, headed in ninety days, was harvested in one hundred and twenty days, and yielded on thin sandy land 52 cavans to the hectare—a most satisfactory result.

TANIAS.

One bulb of this fine variety of "Taro" obtained three years ago from Porto Rico has proved very prolific, and furnished sufficient seed to permit the planting of 150 linear meters. A considerable public distribution can therefore be made next season. It produces a good crop with less water than the varieties previously grown here under the name of gabi, and promises to be a valuable addition to the list of vegetable foods which can be grown without irrigation.

VANILLA.

Vanilla plants received as exchanges a year ago were planted at the Singalong experiment station, and some of them have made leaders 3 meters long. Experiments in growing vanilla will be continued at Sablan, in Benguet.

COFFEE.

A small plantation of hybrid maragogype coffee at Lipa, Batangas, produced its first crop of a little more than 1 pound of berries to the bush. The immunity displayed by this variety to leaf blight was so great that the berries were all quickly bespoken by old coffee planters for seed. A few trees at the Singalong station, under most unfavorable soil and climatic conditions, are nevertheless yielding heavily.

RUBBER.

Cuttings of a rubber vine, *Parameria*, found wild in Mindoro have been brought to Manila and successfully rooted and grown at Singalong. Laboratory analysis shows that 4.52 per cent of the dry bark and 1.48 per cent of the live weight of the plant are pure caoutchouc. The vine is too small to be successfully tapped, and commercial extraction processes must be found before it will be of great value. Small plots produced at the rate of 4 tons per acre, giving a theoretical yield of 120 pounds of rubber to the acre. The time required to secure a crop after the planting of cuttings remains to be determined.

IMPORTANT EXPERIMENTS AT TRINIDAD STATION.

Important experiments in plant hybridization and improvement are being carried on by Mr. Gustav J. Petrelli at this station. Considerable improvement has already been produced in a species of wild raspberry. California oranges and lemons have been successfully grafted on native citrus trees, and promise excellent results. Wild blueberries have been improved greatly in size and flavor, and the bearing period has been much prolonged. A hybrid tomato, which shows considerable power to resist excessive rainfall, has been produced by crossing a native and an imported variety.

By a system of root grafting and training young mulberry trees have been made to produce fruit within a few months, and the berries have been materially improved in quality. Irish potatoes of good size and excellent quality have been raised. Nearly all the standard varieties of temperate zone and tropical vegetables have been successfully produced. Strawberries have been grown in considerable abundance.

A full account of the work carried on at this station and at the Lamao and La Carlota stations will be found in the report of the director of agriculture, which is appended and marked "Appendix F."

THE WEATHER BUREAU.

The work of the weather bureau has been maintained at its usual high efficiency, and, as usual, there is little connected with it to which it seems necessary to call especial attention in an annual report.

IMPORTANCE OF WEATHER SERVICE.

The importance of maintaining an adequate weather service in countries liable to be swept by typhoons was demonstrated in a most striking manner by the terrible consequences attendant upon the failure of the observer in the neighboring colony of Hongkong seasonably to warn the shipping in the harbor of the approach of the typhoon of September 18, 1906. The danger signal was given only twenty minutes before the storm struck the harbor, and in consequence dreadful loss of human life and enormous damage to vessels resulted. Such a thing would have been impossible at Manila, where the public is kept constantly informed of the whereabouts of all typhoons in or near the Archipelago. The efficiency of this service is such that the correctness of typhoon warnings is assumed by everyone.

TIME SAVED IN ISSUING TYPHOON WARNINGS.

In order to save all possible time in issuing warnings of dangerous storms, the observatory has been provided with a direct wire to police headquarters, so that they can be transmitted by telephone, and as all police officers call up the central office at least once an hour, it takes but a short time to inform every policeman on duty in the city of the approach of a dangerous storm, so that he may spread the news along his beat. Persons who would not see the storm signals are thus warned in time to enable them to take the necessary precautions to save their property.

SPECIAL TYPHOON WARNINGS TO NEIGHBORING COUNTRIES.

Besides the very numerous storm warnings sent to the different parts of the Archipelago, 28 special typhoon warnings were sent to neighboring foreign countries during the year.

SEISMIC OBSERVATIONS.

By means of delicate instruments, 126 earthquakes have been recorded in the islands during the year. Ten of these were felt at Manila. Only 2 of the entire number were of any considerable force; that of April 19, which was strong at Manila and somewhat destructive in the Camarines provinces; and that of May 25, which was felt quite strongly in north Ilocos.

Two horizontal pendulums of the Bosch-Omori type were made by the observatory mechanics and installed during the year. They have given extraordinarily good results in recording distant earthquakes. The records made by them have in this respect been more satisfactory than those made by the Vicentini microseismograph. Among them may be mentioned that of the Valparaiso earthquake on August 16; that of the Sumatran earthquake on January 4, and that of the Mexican earthquake about the middle of April.

It is a strange fact that the record or seismogram of the Valparaiso earthquake taken in Manila is probably the only complete seismogram of this earthquake in existence. A copy of it was sent by request to the secretary of foreign affairs of Chile, and the original was requested by a cable by the international committee of seismology, for insertion in its report and for presentation to the International Congress of Seismology to be held in Rome in September, 1907.

MAGNETIC DEPARTMENT.

The work of the magnetic department remains at a standstill, on account of the disastrous effect of the electric current used in operating the street railway system of Manila.

IMPROVEMENTS.

Many improvements have been made at the central observatory, including the installation of wireless telegraphic instruments.

CHANGES IN WEATHER STATIONS.

There have been some minor changes in the stations in operation, the present total being 7 first-class, 9 second-class, 26 third-class, and 10 rain stations, which are supplemented by 5 stations conducted by volunteer observers

NEW WORK.

The bureau now prepares a daily weather map showing the weather conditions at 6 a. m. in the Philippines and in the whole Far East. This map is ready for distribution about noon. The bureau is also issuing a monthly summary of the meteorological elements for Manila, which appears promptly at the close of the month and is given to the public through the medium of the daily press. It is purposed to supplement this form with another, which will give at the end of each month the normal or average values of the various meteorological elements for the coming month, as deduced from many years' observations. Thus, on the 2d or 3d day of each month the public will be informed what were the actual conditions during the month just passed; and on the last day of each month will learn what conditions it may reasonably expect during the month to come.

Owing to the importance which the seismographic work is assuming, and to the demand for records of seismograms, provision has been made to issue monthly a short seismic bulletin for exchange with the most important geodynamic observatories of the world. This bulletin will be, in reality, an advance sheet of the regular monthly bulletin, but will be sent out without delay.

RECEIPTS AND DISBURSEMENTS OF BUREAUS.

Statement of the receipts and disbursements of the several bureaus of the department of the interior will be found in the annual reports of their respective chiefs, which are appended hereto.

Respectfully submitted.

DEAN C. WORCESTER,
Secretary of the Interior.

To the PHILIPPINE COMMISSION,
Manila, P. I.

APPENDIX A.

REPORT OF THE DIRECTOR OF HEALTH.

DEPARTMENT OF THE INTERIOR,
BUREAU OF HEALTH,
Manila, P. I., August 5, 1907.

SIR: Pursuant to instructions issued by the honorable the secretary of the interior for the Philippine Islands, I have the honor to submit herewith the following report upon the operations of the bureau of health for the period from July 1, 1906, to June 30, 1907, this being a complete report of the health work in the islands for the year ended June 30, 1907, and the eighth annual report of this division of the Philippine government.

ALL RECORDS BROKEN.

The effect of the sanitary reforms which have been persistently carried out during the past few years commenced to show in a most concrete and substantial manner during the period covered by this report. The public health has been more satisfactory than at any time since the American occupation of the Philippines, from which it is reasonable to infer that health conditions are better now than at any time for the past one hundred years or more. The death rate per thousand for the city of Manila has been reduced from 40.99 last year to 36.91, the rate for Americans being 5.59, which is a reduction of 3.75 over the previous year, and among Spaniards the rate dropped from 17.40 to 15.84.

There has not been a single case of plague in the islands and not one death from smallpox in the city of Manila. Cholera in recognizable form has disappeared entirely from the archipelago. The provinces of Cavite, Batangas, Cebu, Rizal, Laguna, Bataan, and La Union, where heretofore there have been approximately 6,000 deaths annually from smallpox, have not reported one death from this disease. In all there have been over 2,000,000 vaccinations performed, the direct effect of which was that many lives were spared and thousands of persons were saved from being disfigured for life, and at the few places at which smallpox did break out it made no headway.

The solution of the leprosy problem has passed from the theoretical to the practical stage. The number of lepers September 1, 1905, was 3,580; the number June 30, 1907, is 2,826.

Great strides were made in introducing better drinking water, artesian wells being now in actual use in many of the towns of the provinces.

More detailed information about all these matters will be found under appropriate subheads in the pages which follow.

THE NEW CENSUS OF THE CITY OF MANILA.

During the month of January the bureau of health took a census of Manila, which showed the population of the city to be 223,542, as against 219,941 given by the official United States census of 1903, which is an increase of 3,601, or 16.37 per thousand. The increase by nationalities is as follows:

Americans.....	810, or 18 per cent.
Filipinos.....	5,510, or 2 per cent.
Spaniards.....	375, or 14 per cent.
All other nationalities.....	248, or 27 per cent.

There has been a decrease in the Chinese population from 21,230 to 18,028, or 15 per cent; and among those classified as "Other Europeans" there has been a reduction from 1,117 to 977, or 12 per cent.

The decrease in the number of Chinese can probably be accounted for by—

1. The large emigration to the provinces which has taken place among the people of this nationality as peace conditions in the outlying districts have become more and more secure.
2. The operation of the Chinese exclusion law, which prohibits the immigration of this nationality to the Philippines, and thus prevents the balancing of the losses caused by the mortality.
3. The few births, owing to the small number of the wives of Chinamen living in Manila.
4. The return of many to China to spend the remainder of their lives.
5. The census being taken at a time when a great many Chinamen were visiting their native country to celebrate the Chinese New Year.

The acting secretary of the interior approved the use of the figures of the census taken by the bureau of health, and the same will be used hereafter in compiling all vital statistics.

The census was taken at a time when a considerable portion of the population was absent in the provinces, and no doubt many others remained uncounted, owing to the suspicion with which the more ignorant residents view government officials, they being extremely suspicious that there is some ulterior motive in view, so that the real population is probably much higher than the foregoing figures show.

One fact clearly shown was that the sanitary officials are constantly coming into closer touch with the people, and are no longer always viewed as enemies. The double function that many of the sanitary inspectors now perform, of reporting communicable diseases and insanitary conditions and of providing the indigent with free medicines and having them cared for in charitable institutions, has no doubt had much to do with this more favorable condition of affairs.

CHOLERA.

At the time the last annual report was about to be sent to press the bureau was again busily engaged in combating a cholera outbreak, which threatened to assume serious proportions. In the city of Manila there occurred during the year 848 cases with 744 deaths, and in the provinces 7,085 cases with 5,243 deaths.

The disease commenced to spread by land, both north and south, and it was only through the magnificent fight to eradicate the disease from Tayabas, made by a detail of bureau of health officials, that another serious outbreak like that of 1902 was avoided. The cholera spread slowly from the province of Laguna along the new road which leads from Bay to Lucena by way of Tiaong. The onward march of the disease was stubbornly resisted, and it was only after all effort was concentrated on the narrow neck of land in Tayabas province which lies between Laguimanoc on the west coast (China Sea) and Atimonan on the east coast (Pacific Ocean) that its onward march was finally arrested. It is noteworthy that at no time did the disease spread by sea, thus showing conclusively that the marine quarantine measures were entirely effective.

The measures adopted in combating cholera were practically the same as those given in the last annual report—strict outgoing maritime quarantine; prompt isolation of the sick and disinfection of the premises, and no attempt at quarantine by land.

It is hardly possible to describe the feeling of security which seemed to pervade the public. With the exception of the comparatively small increase in the freight and passenger rates that was imposed upon interisland vessels leaving Manila, no large financial loss resulted. The regular machinery of the bureau of health worked so smoothly that it was able to meet all demands with practically no increased outlay above routine expenditures. If it had not been for the reports which were published daily, the people would scarcely have known that cholera was in their midst, except in so far as they or their friends were directly affected by the disease. The feeling of security was directly responsible for the preservation of many lives, and on account of there having been practically no disturbance to business thousands of dollars were saved.

A detailed report of the cholera for this period will appear later in a medical journal.

PLAGUE.

Since the method of combating plague has been based upon the theory that its eradication could be accomplished by isolating the sick and destroying plague-infected rats, the efforts of the bureau have met with complete success. There has not been a case of plague in the Philippine Islands during the period covered by this report, except those which were accidentally caused by inoculations in Bilibid on November 16, 1906, while prophylactic inoculations against cholera were being made by a mem-

ber of the staff of the bureau of science. In all there were 24 cases due to this latter cause, 14 of which died, giving a case mortality of 58 per cent. The fact that the cases occurred in a crowded institution, with an average of about 3,500 inmates, and that the disease was confined strictly to the inoculated cases, is further convincing evidence of what may be accomplished by modern sanitary science.

Manila and, in fact, the entire Philippine Islands present a plague record which stands in favorable contrast with that of the rest of the Orient. In India about one person out of every 300, or over one million persons annually, are dying of plague. In Hongkong, Amoy, Singapore, Saigon, and other oriental cities having commercial intercourse with Manila many cases are being constantly reported. Doctor Atkinson, the honorable principal civil medical officer of Hongkong, in an address before the Philippine Islands Medical Association at its last session, held in Manila February 27, 28, March 1 and 2, 1907, said:

"It is an almost hopeless task to expect to stamp out plague entirely in Hongkong, seeing how liable we are from our geographical position to reinfection from the neighboring countries. Many insanitary areas and buildings have been allowed to be erected, and it is only by their erection on improved plans and by rigid prevention of overcrowding that plague or any other infectious disease can be stamped out of Hongkong."

The Philippines have been more fortunate, but, of course, are subject to reinfection on account of their geographical position and extensive and increasing commerce. A continued immunity from the disease can be had only through the greatest precautions being taken with vessels from plague-infected ports, and by placing the ports of entry in such good sanitary condition that even if the disease should be imported its eradication could be accomplished easily. This means, so far as Manila is concerned, at least, that the work of improving insanitary areas and of removing or repairing insanitary structures, which was begun several years ago, must be pushed steadily until the last place of that kind has been eliminated.

BERI-BERI.

The mortality from beri-beri in Manila at large was about the same as for last year, there being 403 deaths reported from this cause, as against 378 for the previous year. One death occurred among every 391 Chinese and one death among every 540 Filipinos. No deaths took place among Americans or Europeans.

In public institutions there has been a most marked reduction in the deaths from this disease. At Bilibid, for instance, the number dropped from 21 for last year to 9 for this year. Less and less difficulty is being experienced in preventing the spread of beri-beri in jails and other places where the inmates are under the direct control of the bureau. Practically the only cases with which it was necessary to deal were in those persons who were afflicted with the disease upon admission.

Upon the appearance of beri-beri the nitrogenous constituent of the ration is immediately increased by adding more meat and mongos (small beans), and the amount of rice is correspondingly reduced. In view of the remarkable results recently achieved by Fletcher at the Kuala Lumpur Lunatic Asylum, Straits Settlements, in using a rice which was boiled before being husked, no cases of beri-beri occurring among 123 inmates in the same institution who were kept on this diet, while 43 cases with 18 deaths occurred among a similar number who ate rice which was unboiled before being husked, it may perhaps be that the success which has been had in the Philippines in the management of this disease has been largely due to the withdrawal of a portion of the rice.

The impression has also been gained during the past year that beri-beri is very much less common among persons who eat only Philippine rice which is not husked until shortly before using, owing to the mold which soon renders it unfit for consumption, than among persons who use imported Chinese or Indian rice, which has often been husked for a year or more before being used. However, no systematic observations have been made upon this point, and investigation may prove it to be fallacious. At any rate, the fact that no Europeans or Americans, whose diet is richly nitrogenous as compared with the native Oriental, succumbed certainly indicates that the question of diet as a cause of beri-beri deserves further observation and study.

TUBERCULOSIS.

A large part of each annual report of the bureau of health since American occupation has been devoted to the discussion of cholera, plague, and smallpox, and when the term "dangerous communicable diseases" has been mentioned it was usually in

connection with these maladies. Nearly every general appropriation bill that has been passed has provided funds for combating these diseases. Dangerous and formidable as they are, they are insignificant when compared to the great white plague, tuberculosis, which is the most universal scourge of the human race, about one-seventh of all of the deaths of the world being caused directly by it. During the past year in Manila one-sixth of the total deaths were actually due to this cause. This does not represent the total number of cases, as many persons who have tuberculosis die with intercurrent diseases. Tuberculosis claims more victims, produces more misery, is destructive of more happiness, creates more poverty, and interferes with the public weal to a greater extent than any other disease ever known to man. These facts are appalling, when it is remembered that the disease is preventable, though with greater difficulty than cholera, plague, or smallpox. The disease is largely propagated by unnatural conditions created by the victim or his friends. Environment is an important predisposing factor in the spread of tuberculosis, as proved by the susceptibility of those who live in dark, damp, and poorly ventilated habitations; such persons not only manifest a greater liability to contract the infection, but show a decidedly lower resistive power against its progress.

Every place where people collect in crowds for work or pleasure becomes a danger center. Living in unwholesome lodgings which are damp and dark, ill ventilated, or overheated is one of the chief predisposing causes of tuberculosis. Experience has shown that tuberculosis is preeminently a house disease—a disease of indoor life. Doctor Flick, the noted Philadelphia physician, has truthfully said:

"Without the house tuberculosis would not exist. It depends upon the house for its implantation and propagation and for the evolution of all its phenomena. The house is the place where the *tubercle bacillus* lies dormant in wait for its new host; it is the place where the new host gets his implantation; it is the place where the tubercular subject gradually becomes a consumptive, and it is the place where the consumptive dies.

"If man desires to free himself from the great white plague, he will have to retrace his steps from some of what he considers advanced points of civilization. He will have to learn among other things that fresh air is God's greatest gift on earth, and that whatever shuts out fresh air shuts out health and happiness."

The disease in the Philippine Islands, as elsewhere, is more prevalent in the cities than in the country districts, particularly in the larger cities, such as Manila, where the population is massed together. Its progress is greatly facilitated by insanitary conditions, especially those which favor the presence of bacilli in the atmosphere, and the reduction of individual powers of resistance.

Anything which has a tendency to impair the general health may serve as a contributory cause, but the essential cause is the *tubercle bacillus*, and without this bacillus there can be no tuberculosis. There are three methods by which germs probably gain access to the body—by inhalation, that is by breathing into the lungs; by ingestion, or by being swallowed with food, drink, or saliva; and by inoculation, or by the penetration of tuberculous substances through a wound in the skin.

The most frequent method of propagation is that resulting from the indiscriminate deposit of tuberculous sputum through careless expectoration. If sputum is carelessly deposited so that it becomes dry and pulverized, the action of the air soon causes it to mingle with the dust and the person inhaling the atmosphere thus contaminated is exposed to the danger of contracting the disease. Besides the danger arising from carelessly deposited sputum, the inhalation and ingestion of small particles of saliva expelled by a patient during the act of coughing, especially when the cough is dry, or expelled when he is speaking quickly or loudly, or when sneezing, is a source of danger to all who come in close contact with him. During these acts there are expelled almost invisible drops of saliva, so small that their impact against the skin are not recognized by the nerves of sensation, yet they may contain *tubercle bacilli* and be the means of spreading the disease.

The next most frequent method of propagation, and one to be reckoned with seriously in Manila, is through the ingestion of the germs of the disease with food and water which may become contaminated by dust, by contact with flies or insects, by careless handling, or by careless spitting. The third and much less frequent cause of tuberculosis, the inoculation or penetration of the tubercular substance through the skin, is by no means rare in the Philippine Islands.

The bureau of health has issued a bulletin setting forth all these methods of conveying the disease, and urging appropriate prophylactic measures. Attention has been called to the fact that the expectorations of a patient suffering from pulmonary tuberculosis, no matter what the stage of the disease is, may spread the infection if the matter expectorated is not rendered harmless before it becomes dry and pulverized.

It is being urged that all tubercular patients should make use of spit cups made of metal, in which some disinfecting fluid should be kept, in order that the sputum may be disinfected and thereby rendered harmless. An effort is being made to have provided in schools, churches, factories, stores, railway cars, waiting rooms, restaurants, saloons, theaters, and other places where people congregate an ample supply of sanitary cuspidors. The use of the pocket handkerchief as a receptacle for sputum is dangerous.

The bulletin on tuberculosis discusses the symptoms and signs of the disease and urges the importance of an early diagnosis, especial stress being placed upon the importance of prevention, and teaches that tuberculosis may be prevented by proper precautions. The sputum is the greatest source of infection and should receive the greatest care. These precautions referred to consist of destroying the sputum of infected persons before it has time to dry; of admitting plenty of fresh air and sunlight to all living rooms; of avoiding the raising of clouds of dust by sweeping or otherwise; of keeping the general health of the noninfected at the highest standard; of eating wholesome food; of systematic bathing, which should include the sponging of the chest; and of observance of the strictest rules of personal hygiene—in other words, “living as close to nature as possible.” Floors should always be dampened or sprinkled with wet sawdust or damp sand before being swept.

The same rules of personal hygiene with appropriate medical treatment will cure the majority of cases, if taken in time. The greatest mistake that can be made with reference to the disease, except the use of advertised or quack remedies or “consumption cures,” is to deny its presence or to delay treatment by proper measures.

In the profession of medicine there are no secret remedies or methods; such belong exclusively to the quacks and should be avoided as worthless, dangerous, and unscientific.

Sanitariums, hospitals, dispensaries, care stations, and special facilities for public notification are called by Professor Koch the heavy artillery in the battle against tuberculosis, while he designates all efforts to instruct the people as to the danger of tuberculosis, to arouse by proper publications the interest of the masses in combating the disease, and all other means, as the lighter weapons. In some battles the heavy artillery proves more effective than the lighter weapons, while in others the credit must be given to the latter.

The time will soon come when State and municipal governments will take the initiative in the great work of prophylaxis. The expense involved is too great for private resources to bear. The first step will be compulsory notification; then will follow measures for protecting the public by taking adequate precautionary means, properly supported by legal authority, against the spread of the disease by the filthy habit of indiscriminate spitting; the betterment of domiciliary conditions, especially with reference to ventilation; and, finally, the enlightenment of the patient himself.

Koch's five measures for combating the disease are substantially as follows:

First. “Compulsory notification of all cases of infection or open cases of tuberculosis to the board of health.”

Second. “Hospital for advanced cases.”

Third. “Sanitariums for incipient cases for the purpose of a practical education in the cure and the prevention of the disease; also instructions to medical men and students in the means of making a diagnosis at a time when most cases can be cured.”

Fourth. “The establishment of free dispensaries for the poor and provisions for furnishing such patients with food, raiment, medicine, and proper sanitary environments in their homes, and proper instruction in nursing by persons who are trained in sanitary methods and in the use of sanitary appliances.”

Fifth. “Sanitary homes and workshops, and by educational campaign through the press, lectures, and leaflets, giving concise description of the disease, its causes, and the best method of cure and prevention.”

If the sputum question could be settled definitely in favor of hygienic precautions, the disease would very soon be eliminated from the Philippine Islands. In the city of Manila the sanitary code makes provision against spitting on the sidewalks and in public places. This is a step in the right direction, but the great trouble lies in the lack of knowledge and appreciation of the people of the true nature of the disease. Where one case is contracted on the street, perhaps a thousand are contracted in houses, so that after all the campaign resolves itself into one of education, not of law. The work has already been inaugurated. The results are slow to manifest themselves, but are sure to come if the present policy is continued with patience, perseverance, and energy. The contents of the bulletin on tuberculosis which was prepared by the bureau of health during the year are now being taught in the schools of the Philippine Islands, and it is hoped that this campaign of education which has been thus begun will be

the forerunner of a movement which will result at least in greatly reducing the number of cases of tuberculosis in the future.

DIPHTHERIA.

Heretofore the only cases of diphtheria which came officially to the knowledge of the bureau of health were those which arrived upon incoming vessels, most of them occurring upon navy ships. During the past year, however, several cases have been reported in different portions of the islands, the diagnosis of some of them being confirmed microscopically.

Several cases occurred in Catbalogan, Samar, which presented all the clinical appearances of diphtheria, but the diagnosis was not confirmed bacteriologically.

One case occurred in the city of Manila, in an American child who had been resident here for more than a year previous and, so far as is known, had not come in contact with anyone who had diphtheria. The disease developed several days after Christmas presents were received from St. Louis. Whether the infection had been conveyed by the presents or in the packing with which they were surrounded is, of course, not known.

During the latter part of May, 3 cases occurred in a Filipino family, the members of which had been residents of Manila for many years, and the parents are very positive in their statements that none of their children had come in contact with any person from incoming ships for at least several weeks previous to the appearance of the disease. In this family there were 3 cases and 2 deaths. In all, there were 10 cases with 8 deaths reported for the year. Recovery took place in the 2 cases in which antidiphtheritic serum was used.

YAWS.

During January and February a number of cases of yaws were reported in Parañaque, a small town situated on the Bay of Manila just outside the city limits. No deaths are known to have occurred. On March 1, a case of yaws occurred among the lepers at the San Lazaro Leper Hospital; seven days later 3 additional cases were reported, and in the succeeding fourteen days there were 2 more, the last case having been reported May 12, making a total of 7 cases in all. No fatalities occurred among them. Microscopical examinations made of the specimens taken from the lesions showed a spirochæte similar to the one described by Castellani to be present.

TYPHOID FEVER.

Typhoid fever seems to have obtained a firmer foothold in the Philippines than has heretofore been the case. As the changes which ordinarily accompany the introduction of advanced civilization are being more and more introduced in these islands, it is becoming apparent to a greater degree that this disease is constantly affecting more persons. At the present time the construction of the new railroads in the islands is responsible for the gradual introduction of typhoid at many places at which it has not been encountered heretofore. Fortunately many of the cases appear to be due to direct importation, the disease appearing among Americans and Japanese who have only recently come to the country; the patients either arrive during the incubation period or, possibly, have ingested foods obtained in countries from which these new arrivals came. It would also appear probable, in view of Soper's recent investigations in New York, that there are individuals arriving here who have infected gall-bladders or who at least excrete typhoid organisms in their stools. It seems logical that the reasons why typhoid has not spread more heretofore in the Philippines are not so much on account of the tropical climate, but because the ordinary vehicles by which the disease spreads have not been present. For instance, it is only a few years since milk of local production has been used to any extent in the islands; there were practically no general water distributing systems or reservoirs; in the absence of sewer systems, it was almost impossible to infect places in which oyster and other shellfish grow. These facts, together with the comparative absence of flies during the greater portion of the year, are all explanations as to why there has not been heretofore a more general spread of the disease.

Every effort was made to trace the origin of the infection in the cases that occurred in the city of Manila. A medical officer was detailed for this purpose, who spent several weeks upon the investigation, but no definite conclusions were reached.

It has been the opinion of the bureau of health that if the Mariquina River, from which the water supply of the city of Manila is drawn, should become infected with typhoid fever, a wide-spread epidemic would occur in the city of Manila, and from there the disease would very probably be carried all over the Philippine Islands. For

this reason extra precautions have been taken in order that the bureau might keep well informed as to whether any cases of typhoid were occurring among residents who lived on the watershed. So far not a single case has been found, and it is probably due to this fact that Manila has enjoyed a comparative immunity from this disease. There were reported in all in the city of Manila 58 deaths from typhoid fever during the year, but of this number the diagnoses of not more than 8 or 10 were verified by laboratory methods.

GANGOSA.

The first person in the Philippine Islands definitely known to have been afflicted with gangosa, or rhino-pharyngitis mutilans, the name suggested for the disease by naval medical officers, died at St. Paul's Hospital, in this city, during the month of January. Cases may have occurred in the past, but, if so, they have escaped recognition. Extensive inquiry among Filipino and Spanish physicians who have been in the islands many years tends to show that, while cases of a disease with similar symptoms have been observed, they were generally regarded as leprosy and no distinct separation was ever made. The disease is an infectious, painful, and disfiguring malady, due to a cause prevailing extensively in Guam, but the nature of which is still unknown. The nose and upper part of the face are destroyed by slow ulceration, while the tongue is never affected. Cases have been observed in persons from 3 to 80 years of age. The disease sometimes lasts from several months to a number of years, and even during this period, in its active stage, there is no reduction in flesh or strength. The mortality is low, yet the disease, however, is not very amenable to treatment, although antiseptic methods appear to retard the extension of the ulceration.

During the time that lepers were being collected from the island of Leyte a case with many of the symptoms of gangosa was encountered and removed to the San Lazaro Hospital, in Manila, where it died the latter part of May. A careful autopsy was made, but owing to the microscopical work not yet having been completed it is not possible to state whether the case was one of gangosa or not.

PARAGONIMUS WESTERMANII INFECTION.

During the year the pathologist for Bilibid hospital found 17 persons at Bilibid prison who were infected with *Paragonimus westermanii*. Of these cases 8 were fatal, the diagnoses having been made at autopsy. Medical men connected with the hospital are of the opinion that the disease is much more common in the Philippine Islands than has heretofore been thought to have been the case. It is believed that many of the cases which are now diagnosed tubercle of the lungs are in reality fluke infections. In several of the cases trematodes were not confined to the lungs, but were found in various organs of the body and particularly in the brain. In making sections of the lungs a large number of burrows are usually found to be scattered throughout the organs, and in the burrows a material which is similar to that of the sputum found in living cases is encountered. The walls between the burrows frequently break down and thus make large cavities.

MEASLES.

Measles has continued to be a most rare infection in the Philippine Islands. Only 3 cases were encountered during the year among Filipinos, but importations of this disease took place. The transport *Logan*, which arrived here during the latter part of March, had on board 2 cases of measles among soldiers, and upon their being transferred to Fort William McKinley several additional cases developed. Owing to the prompt measures taken by the military authorities, no further spread of the disease took place.

MALARIA.

During the year 23 deaths less from malaria were reported for the city of Manila than for the previous year, the total number being 173. On account of the fact that the great majority of these diagnoses were not confirmed microscopically, it is exceedingly doubtful as to whether there was actually that number of deaths from this disease in the city. The *Anopheles* mosquito is not very common in Manila, and it is believed that the majority of the cases of malaria are contracted outside of the city. In the provinces, particularly in Albay and the Camarines, the disease has been very much less than heretofore, which fact can be ascribed perhaps to the free distribution of enormous quantities of quinine which have been issued to residents of these districts. The question of mosquito extermination in the Philippines, with reference to reducing malaria, will be taken up in another part of the report.

INSANITY.

In the United States 1 insane person (with the insane are included the feeble-minded) is encountered in every 466 of the population. These figures are based upon a population of 70,000,000 and only include those persons who are confined to hospitals or other institutions. In Great Britain 1 person out of every 304 is insane, and in the Philippine Islands 1 person out of every 1,667 is reported as being insane. This would indicate that insanity is far less prevalent in the Philippine Islands than elsewhere. These figures are particularly significant in view of the fact that consanguineous marriages in the Philippines are said to be very common, and since such marriages have been ascribed as one of the principal causes of mental derangement, it is noteworthy that they seem to have no effect in the Philippines as a cause of insanity. It will be interesting to note in the future whether the increased nervous tension which naturally accompanies a higher civilization will be conducive to an increased proportion of insane in the Philippine Islands. The percentage of recoveries at the San Lazaro Insane Hospital compared favorably with results reported in Great Britain, there being 27, or a percentage of 19.

The bureau of health census of the insane of the Philippine Islands shows that there are 1,969 males and 1,480 females, or a total of 3,449. Of the 1,969 male adults 1,422 are single, and of the 1,480 female adults 922 are single. Three hundred and seventy-nine male adults and 313 female adults are married, while 104 males are widowers and 202 females are widows. It is probable that in this census weak-minded persons are included as insane.

Mental disorders have undoubtedly received less attention from physicians in the Philippines than have any other class of disease. At the present time the municipalities are charged with caring for the insane, but in nearly all cases they are absolutely without facilities for so doing. If the insane are harmless they are permitted to go the even tenor of their way, and if violent the only remedy is to lock them up in the municipal jail or chain them in their houses.

Of the 3,449 insane in the Philippine Islands less than 300 are cared for in asylums. The bureau of health maintains by contract 164 in the Hospicio de San José, and there are accommodations for 90 in the insane department of San Lazaro Hospital.

The Commission recognizing the great need for further provisions for the insane, acted favorably upon the recommendations made in previous reports and on December 26, 1906, appropriated the sum of ₱55,000 to erect and equip a new insane ward at San Lazaro Hospital for the care of 250 additional insane. This building, plans of which were drawn by the consulting architect to the Commission, is of the most modern type, being constructed of reinforced concrete. It is believed that this type of structure is an ideal one for the Philippine Islands, as it successfully meets several indications, the most important of which is that it is as near earthquake proof as any building can be, as shown by the experience in the San Francisco disaster. It also insures protection from heat and resists the effects of the prolonged rainy season. Stone buildings nearly always become damp and musty, and frame buildings do not resist the elements and are very dangerous because of the facility with which they take fire during the dry season. This new building is a radical departure in hospital construction and will serve as a guide for the future. As soon as proper facilities are provided this bureau will recommend a law to cover the commitment of the insane. The procedure at this time is to have the patient arraigned in the courts, after which a committee of medical men is appointed to make an examination and report the condition. It is hoped that with the increased accommodations, which will be available by August 15, 1907, the most pressing cases may be taken care of. The bureau has been much embarrassed in the past in not being in position to provide for many cases that were brought to its attention.

The distribution of the insane by provinces is the subject of a detailed statement to be found elsewhere in this report.

AMOEBC DYSENTERY.

There was again a decided increase over the last year in the number of deaths reported in the city of Manila from amoebic dysentery, 344 deaths being recorded, as against 288 for the year preceding. Believing that much good might be accomplished by giving instructions, particularly with regard to the prophylaxis of this disease, Bulletin No. 6 has been prepared and arrangements have already been made with the bureau of education to have it taught in the public schools throughout the Philippine Islands. It is hoped that by disseminating knowledge with regard to dysentery by this general method the prophylaxis may become better understood and the number of persons who are afflicted with this disease gradually lessened.

LEPROSY AND ITS TREATMENT.

While our knowledge with regard to the cure of leprosy has not been materially enhanced during the year, yet the policy of segregating lepers at the Culion Leper Colony bids fair to free the Philippine Islands from this most loathsome disease. The reduction in the number of lepers in the Philippines, which was so confidently hoped for, even after a portion of the territory has been rendered free from sufferers from this disease, has been more than fulfilled. At the close of the last fiscal year there were 3,494 lepers in the islands; at the close of this fiscal year the records show that the number has been reduced to 2,826. This reduction, in a large measure, has been due to the fact that in those islands from which the lepers have been removed no new cases occurred so far as can be determined, and also to the fact that in a number of islands, and more particularly in Samar and Leyte, many unfortunates who were afflicted with disfiguring, ulcerating diseases were classified as lepers, but on careful microscopical examination were found free from the disease.

In the work which was recently undertaken in collecting lepers from the islands of Samar and Leyte, for the purpose of transferring them to the Culion Leper Colony, considerable additional evidence has resulted in showing that many of the diagnoses of leprosy which have heretofore been made were erroneous. In order that the matter might be placed upon a definite, scientific basis, the steamer which was sent for the purpose of collecting lepers was fully equipped with a bacteriological outfit, and several competent microscopists accompanied the expedition for the purpose of making microscopical examinations of all cases before they were taken on board and of studying some of the skin lesions which are so frequently encountered, and many of which have undoubtedly been diagnosed as leprosy heretofore. In order to aid this work as much as possible, and with the hope of having an opportunity to have as many cases of skin lesions as possible present themselves, instructions were sent out in advance to the local officials to have every person present ready for microscopical examination who showed any evidence, even though slight, of being afflicted with leprosy or who had any ulcers or contractions of any sort. In this way several hundred persons were brought to the different ports, and in many cases they presented a most repulsive appearance, but on microscopical examination they were found to be afflicted with tropical ulcers, phagedenas, or syphilis. Quite a number of cases of the latter were found, particularly on the island of Samar. The *Spirochaete pallida* was demonstrated in many cases.

In collecting lepers no serious difficulty was encountered and so far this feature of the work has given rise to less friction than would ordinarily be expected to be the case. The attitude of the people was no doubt largely brought about by their learning that excellent accommodations and care are given to lepers at Culion, the greater majority of them, no doubt, having better houses, better clothing, and better food than they have enjoyed before their transfer to that island, and this, coupled with the fact that they are not compelled to work, has a strong tendency to make them contented. The fact that many cases were not accepted as lepers, and that in many instances proper treatment resulted in their speedy cure, also made a most favorable impression upon the people and did much to gain their confidence in the efforts of the bureau of health.

From the foregoing it will be evident that if new infections can be prevented the natural mortality among these unfortunates will soon result in the complete solution of this problem.

All lepers, so far as known, have now been removed from the islands of Mindoro, Masbate, Romblon (which includes Tablas and other islands under the same provincial government), Siquijor, Negros, Panay, Palawan, Cuyo, Camaguin, Bohol, Samar, Leyte, and Marinduque. The work of removing them from Cebu is now under way, over one-half having already been transferred to Culion. From the foregoing, it will be seen that fully one-fourth of the territory of the Philippine Islands, or 28,615 square miles, has been freed from leprosy.

At the close of the fiscal year the total population at Culion Leper Colony was 739. Accommodations are now available at Culion for 1,000 lepers, and the Commission has already informally expressed its willingness to appropriate the necessary funds for taking care of that number at the colony, so that the work of completing the collection of lepers upon the island of Cebu can be completed at once, and when this is done practically the entire Visayan group of islands will be free of this disease.

Up to the present time the policy of not permitting nonleprous friends and relatives of lepers to accompany them to Culion has been strictly adhered to. For such persons as may desire to be near their afflicted relatives arrangements can be made to reside on the island of Busuanga, which is only a few miles away, and from which place frequent visits to Culion will be permitted.

The policy of not permitting nonleprous persons to reside at Culion may seem cruel and heartless, especially to those who are directly affected by its operation, but it

is hoped that the close proximity of the island of Busuanga, where they may reside, will do much to mitigate this objection. Isolation is for the best interests of all concerned, for the benefit of the patients, and for the protection of the public. It is unfortunate that in this particular the ends of science and sentiment must diverge, but it is very much to the credit of the persons who have been most affected by this policy that they have been most reasonable in accepting the wishes of the government with regard to this matter.

In view of the experience obtained in Hawaii, in Europe, and other countries, and the experience of the past year in the Philippines, it is thought that whatever may be the views of well-informed persons with regard to the communicability of leprosy, and however widely eminent medical men may differ upon this question, yet the incontrovertible fact remains that every leper capable of giving off the leprosy bacilli to the media that surrounds that leper is at least one source of infection, and the utter hopelessness of successfully eradicating the disease so long as the exact mode of transmission is not conclusively proved will be apparent to all, and prophylactic medicine should not be permitted by a few sentimentalists to be turned from its march to a goal which offers the magnificent victory of the eradication of this plague from the face of the earth, and the saving of hundreds of human victims who are now sacrificed annually to this most loathsome disease.

X-RAY AND OTHER TREATMENTS FOR LEPROSY.

After the most vexatious and annoying delays the new X-ray apparatus was secured in the United States and finally installed ready for use at the San Lazaro Hospitals about the 1st of November. The present outfit consists of:

One Kny-Sheerer Company's induction coil, type "B", 18-inch spark.

One motor generator for alternating current to suit coil and to operate on city current of 220 volts and 60 cycles (single phase).

One combination wall switchboard, including volt-meter, ammeter, lamp, etc. (latest type).

One mercury turbine interrupter.

One electrolytic interrupter, Wehnelt's patent; 3 platinum points, different sizes.

One vibrating interrupter, including condenser.

Two mica spark gaps.

Four tubes, wires.

One Kny-Sheerer floor tubes stand.

One fluoroscope, double cyanide 8.X10 with lead glass screen.

One hydrometer syringe.

Four Muller's X-ray tubes with patented vacuum regulator.

Four Muller's X-ray tubes, water cooled, with patent vacuum regulator.

Four Gundlach X-ray focus tubes with principle; diameter of bulb, 6 inches; sparks, 20 inches.

Two yards lead foil rubber sheeting; rubber on both sides, thin.

In supplying the following data for this annual report it is proper to state that it is not the purpose to enter into a scientific discussion of the treatment of leprosy; this will be due later when more observations are available and the same published in a medical journal, but on account of the general interest in this subject the following is respectfully submitted:

On November 2, 4 patients were placed under treatment; November 3, 3; November 4, 4; November 5, 1; November 6, 6; November 7, 10; and April 30, 1907, 1, making a total of 29 cases actually treated. The results, up to the close of the fiscal year, are as follows:

Very markedly improved.....	8
Considerably improved.....	13
No change.....	7
Died.....	1

From the foregoing it may be seen that so far, at least, the X-ray has not proved as specific for the cure of leprosy, yet better results have been obtained than with any other treatment that has heretofore been used, and even if the percentage of recoveries should be no larger than in the past it would at least offer some hope to individuals afflicted with this disease.

In treating these 29 cases they were chosen much in accordance with the rules which prevailed with the cases that were treated so successfully in 1905, namely, cases of the tubercular variety which showed a large number of hypertrophic lesions, especially those having enlarged ears and noses. The regular Gundlach tube was used, and from 90 to 100 treatments have been given in the majority of cases. The exposures have been for ten minutes at a distance of from 5 to 10 inches, the intensity of the light used

being sufficient to give a distinct outline of the bones of the hand and wrist. The treatments were given at first every three days and later every second day, experience having demonstrated that patients are unable to stand more. The eyes are invariably protected by suitable shields. After a short time nearly all of the patients presented a very much blackened countenance, but this does not seem to make them uncomfortable. In the few instances in which burns were produced they healed very kindly and in a very short time. Partial alopecia was produced in about one-fourth of the cases. The 1 death was due to lobar pneumonia and was apparently in no way connected with the X-ray treatment.

In the 7 cases which showed no change all at least are in as good health as when the treatment was begun, and if no improvement has been brought about in several of these cases at least the progress of the disease has been temporarily arrested.

Of the 13 patients who showed improvement their general health is as good, if not better, than when treatment was undertaken. Clinically, the improvement consists in a reduction in the size of the ears and nose, and the disappearance of numerous leprosy nodules in various portions of the body.

Of the 8 that showed marked improvement the hypertrophy and infiltrations have almost entirely disappeared, and the only evidences of the disease they present are the scars which are left from previous ulcerations. Several of them still have partial contractions of the fingers. Three of the foregoing are frequently found negative upon microscopical examination.

In addition to the treatment by the X-ray, almost every other remedy which has been suggested has been tried, if the same could be applied with a reasonable assurance that it would not be detrimental to the patient. The treatment by Chaulmooga oil with strychnine has been highly recommended for the treatment of leprosy, some cures having been reported from the colony in Louisiana, and also used with considerable success in India and Africa, but the results were not sufficiently encouraging to make the cases worth while reporting here. In 1 of them there was apparently some reduction in the size of the lesions, but at best it was very slight.

During the month of February through the kindness of Dr. Kannosuke Miyajima, who was delegate of his Imperial Japanese Majesty's Government to the Philippine Islands Medical Association, the bureau came into possession of a number of bottles of leprol, which is an oil now being tried in Japan. This has been persistently used since that date upon 2 cases and, clinically, they are very much improved, but still show the leprosy bacilli in their tissues. With the exception of the X-ray, this leprol produces better results than any other treatment which has been tried heretofore.

We are constantly in receipt of letters from various portion of the world which suggest methods of curing leprosy, but it is found, when request for samples of the remedy is sent and information with regard to its composition is asked that it is usually unanswered.

CONCLUSIONS.

The foregoing experiences are not sufficient upon which to make a definite statement with regard to the value of the X-ray treatment as a cure for leprosy, and considerable more work in this direction will be necessary before any reliable statement can be made upon this subject.

SMALLPOX.

During the year there has been unquestionably less smallpox in the Philippines than has been the case for a great many years previous. In the provinces of Cavite, Batangas, Cebu, Batasan, La Union, Rizal, and Laguna, where heretofore there have been more than 6,000 deaths annually from this one cause alone, it is most satisfactory to report that since the completion of the vaccination in the aforesaid provinces, more than a year ago, not a single death from smallpox has been reported; from which it may be seen that, if the bureau could show no further result for the year than the saving of these human lives, it would more than have justified its existence. In fact, if any justification were needed for American occupation of these islands, these figures alone would be sufficient, if nothing further had been accomplished for the benefit of the Filipinos.

The question of smallpox will receive further consideration under the head of vaccination.

VACCINATION.

When the great Edward Jenner was a medical student, the casual remark made by a farmer's daughter that she could not take smallpox because she had cowpox so impressed him that he began an investigation of the question with the idea of devising some means for lessening the terrible scourge, which at that time was devastating

all Europe. It is doubtful whether any people have benefited more from this discovery than residents of the Philippine Islands. So thoroughly are the Philippines saturated with the contagion of smallpox that probably 25 per cent of the residents would soon succumb to this disease if it were not for the ability to protect the inhabitants against it by vaccination.

Vaccination is one of the most accurate and triumphant discoveries of medical science. It was the first important proof of the ability to prevent disease by immunization. Jenner's announcement created great opposition at the time, and even to-day there are antivaccination societies in nearly every portion of the world. The only explanation for this state of affairs appears to be the innate perversity of human nature. No sane, reasonable individual could very well deny the efficacy of vaccination if he were acquainted with the systematic regularity with which the bureau of health eradicates smallpox from communities almost every week in the year, with no other weapon than vaccination. Owing to the liberal provisions made by the Commission during the past year, it has been possible by systematic methods to vaccinate 2,022,380 persons, which is an increase of 1,072,255 over last year. Fifty thousand more were protected by vaccine used by local officials at places where the disease made its appearance. These figures probably represents a greater number of vaccinations in proportion to the number of inhabitants than have ever been vaccinated in any country in a similar period heretofore. The complete cessation of deaths from smallpox in the provinces in which the people have been thoroughly vaccinated is the best answer to doubts which may be offered as to the efficacy of vaccination.

Since the beginning of systematic vaccinations there have been 3,515,383 persons vaccinated. Of this number 1,315,478 were reported as successful vaccinations, and since only 2,401,806 were inspected after vaccination took place it is quite probable that even a larger percentage of "takes" was produced than the figures show.

During the year further experience with vaccination indicated that a few minor changes were desirable in the instructions which were used as guides for vaccinators, and a modified circular was issued as follows:

"MANILA, March 13, 1907.

"CIRCULAR F-8.

"Regulations for provincial vaccinators.

"1. Circular C-28, April 18, 1904, and E-8, February 13, 1906, from this office, and all circulars amendatory thereof are hereby revoked, and the following regulations will hereafter govern vaccination in the provinces:

"2. *Organization.*—Vaccinators will be assigned to groups under charge of a district health officer or other employee of the bureau of health who has been designated as in charge, who will be responsible for the proper performance of the work. The inspector in charge will personally supervise, to the fullest extent practicable, the work of his group. No unnecessary details of vaccinators for clerical work, to the exclusion of actual vaccination, will be allowed. One clerk will ordinarily be sufficient for a group, and he should be able to devote the greater portion of his time to actual vaccination.

"3. *Itinerary.*—Upon being assigned to a province, the inspector in charge will arrange an itinerary for that province which will take up its various municipalities in such order as will cause the minimum expenditures for traveling expenses, at the same time due regard being had that sections which are not accessible in the wet season are vaccinated in the dry season. A copy of such itinerary will be forwarded to the director of health for his information. A provincial group will usually work as a whole within a municipality, and each municipality will be completed before proceeding to the next. Departures from the regular itinerary or the division of a group among two or more municipalities will only be made in case of emergency, the reason for such departure from the itinerary being reported by letter to the director of health as soon as possible.

"4. *Order of work.*—Upon arrival in a town the exact official census of the same should be ascertained, and the work shall not be considered completed until such number of persons have been vaccinated as will correspond to the census.

"Whenever practicable the inhabitants of a barrio will be caused to present themselves at some central point in such barrio at an hour previously arranged with the concejal or teniente of the barrio, and a sufficient number of vaccinators will be detailed to vaccinate the entire population of such barrio promptly. When such an arrangement is impracticable, barrios and pueblos will be taken up systematically, street by street and house by house, until finished. In vaccinating large barrios at such distance from the poblacion as to require hiring of transportation, the vaccinators detailed to such a barrio should not leave the barrio until the work is completed.

"5. *Conduct of vaccinators.*—Vaccinators will be required to wear the prescribed uniform while on duty; to keep their person and clothing neat and clean; to give especial attention to their hands and finger nails, and to comport themselves with proper courtesy and consideration toward the public.

"6. *Who shall be vaccinated.*—No persons will be excused from vaccination except infants under one month; those suffering from an acute illness; extreme old age, and persons presenting satisfactory evidence of having been successfully vaccinated or of having had smallpox within the preceding twelve months. Hysteria or 'nervios' and pregnancy will not be accepted as cause for exemption.

"7. *Method of performing vaccination.*—Inspectors will see that vaccinators observe the following routine in performing vaccination:

"(a) Scrub site of vaccination with a pledget of cotton wet with alcohol.

"(b) Sterilize lancet in alcohol flame.

"(c) Shake tube of virus.

"(d) Take virus on blade of lancet.

"(e) Scarify, stretching skin with other hand.

"(f) Rub virus into scarified area with flat of blade.

"(g) Warn person vaccinated not to touch scarified area nor to allow clothing to do so until thoroughly dry.

"(h) No further care is necessary.

"8. *Certificates of vaccination.*—For each vaccination performed the vaccinator will deliver to the subject thereof a certificate properly filled out on Form 36, B. H. Certificate numbers will run serially for each municipality. The attached slip will be delivered undetached from the certificate, to be subsequently detached and turned in by the vaccinator making the inspection.

"9. *Vaccinator's reports.*—Each vaccinator at the close of the day's work will be required to make the proper entry upon Form 60, B. H., from the stubs of his certificate book.

"10. *Inspections.*—When making inspections, each vaccinator acting as inspector will note the result of the vaccination on the certificate and detachable slip, and will take up the slips and turn them in at the close of each day's work.

"11. *Amount of work to be accomplished.*—Vaccinators will be required to work at least eight hours each day, except Sundays and legal holidays. Local holidays will not be observed. It is expected that the average number of vaccinations performed daily will not fall below 100.

"12. *Other reports from vaccinators.*—Vaccinators will be required to make report of all lepers, insane, blind, and deaf and dumb, and of all dangerous communicable diseases encountered by them. The records of the municipal board of health or of the municipal secretary will be checked up with these reports, the necessary corrections made, and a copy sent to the director of health through the inspector in charge of the party. If dangerous communicable diseases be encountered, the inspector in charge will at once notify the president of the municipal board of health or the municipal president, and in conjunction with them arrange for the necessary measures of isolation, disinfection, etc.

"13. *Relations with local officials.*—Inspectors will cultivate cordial relations with the provincial and municipal officials and seek their cooperation, and any failure to secure same, with the reasons therefor, will be reported by letter to the director of health. Attention is called in this connection to a circular letter from the governor-general, addressed to all provincial governors under date of June 30, 1904, as follows:

"The bureau of health for the Philippine Islands is inaugurating a system whereby it is hoped that every person in the islands may be vaccinated and the danger of infection by smallpox effectually removed.

"The civil governor requests that you issue instructions to every municipal president in your province in respect to this matter, inviting attention to the provisions of act No. 309, Philippine Commission, and request them to render every assistance to the vaccinators of the bureau of health.

"Kindly acknowledge receipt of this circular and advise this office of the action taken in the premises.

"(Signed) F. W. CARPENTER,
"Acting Executive Secretary."

"14. *Municipal boards of health.*—Presidents of municipal boards of health will be under the orders of the district health officers while vaccination is being carried on in their respective municipalities, and will assist in the work. It is believed, however, that their cooperation in securing the assembling of the inhabitants of each barrio at some central point, and in other similar ways, will facilitate the work to a greater extent than their actual presence as a member of the group of vaccinators. The cooperation

of the municipal president and the police should be secured toward the same end when necessary.

"15. *Supplies*.—Requisitions for supplies, other than vaccine virus, required in the work of vaccination will be made on Form 1, B. H., and will ordinarily be made in such quantities as to cover the estimated needs for one month where communication with Manila is frequent and regular. Vaccinating parties operating in remote places where communication with Manila is infrequent and irregular should carry on hand a three or six months' supply, or sufficient to meet conditions. The following schedule may be used as a basis when preparing requisitions:

"One lancet, one-half pound cotton, and 8 liters of alcohol per man per month.

"One alcohol lamp per man.

"Four forms 1, B. H., per month each party.

"One hundred forms 36, B. H., per man per day.

"One book, Form 20, B. H., per man per month.

"Two forms 59, B. H., per month for each party.

"Two forms 60, B. H., per man per month.

"Four forms 115, auditor, per man per month.

"Bills of lading to cover shipments of property returned to Manila.

"The stationery to be used by vaccinating parties will, so far as possible, be confined to the following articles:

"Letter heads, rubber erasers, paper fasteners, black ink, scratch pads, blotting paper, wrapping paper, lead pencils, pens, and twine.

"Variations from the above will be made when experience indicates that it is necessary.

"16. *Vaccine virus*.—Shipments of vaccine virus for the supply of groups operating in provinces distant from Manila will be made in portable ice boxes, and requisitions will call for quantities in proportion to the frequency of communication, reliability of schedule, and facilities for preservation existing at the base of operations. Unless definite arrangements have been made with this office to have virus shipped at regular intervals, officials in charge of parties should invariably wire this office as to the number of units they desire shipped from Manila on a given date, for instance:

"HEALTH, Manila.

"Ten thousand, April 9th.

"RUIZ."

"Such information should always be forwarded several days before the steamer is expected to sail from Manila. Inspectors will be notified by wire of each shipment and will arrange to receive the virus promptly. Empty ice boxes will be returned to Manila by first available transportation, the date of shipment and name of vessel being wired to the director of health. Empty ice boxes should be returned by such steamship lines as have agreed to return them free of charge to Manila. When the base of operations enjoys frequent and regular communication with Manila, and is not more than forty-eight hours distant, vaccine virus may be sent by mail or other convenient method, without special measures for preservation, and requisitions should be frequent and for small quantities.

"17. *Alcohol*.—Whenever alcohol of 36 degrees strength can be purchased in the provinces for ₱0.50 per liter, or less, the same should be obtained there and separate bills, on Form 5-A, sent to this office for payment.

"18. *Pay of vaccinators*.—Vaccinators will be paid by check from Manila, on pay rolls made up and forwarded by the official in charge of the vaccinators, under the following rules:

"(a) The pay rolls will be made out in triplicate for the entire party on the 23d of each month (including that date) and certified by the officer in charge of the party and forwarded to this office immediately.

"(b) The 'Name,' 'Designation,' 'Period of service' (1st to 30th), and 'Authorized monthly rate of pay' columns only will be filled out before forwarding. The 'Amount received,' 'Signature,' 'Witness,' and 'Remarks' columns may be left blank.

"(c) On the last day of the month telegraphic reports will be made by the chief of the party of all absences during the month. The pay rolls will be held in this office until such a report is secured.

"(d) Each official in charge of a vaccination party will be furnished with a letter which will state the maximum number of vaccinators that may be employed and their rates of pay. In no case will pay rolls for an additional number be approved unless specific authority from this office is first had. The separate appointments heretofore issued by this office will no longer be required.

"Officials in charge of vaccination parties are authorized to use their own judgment with regard to promotions or reductions in salary, provided they do not exceed the

highest rate authorized in the letter referred to above. It is suggested, however, that, except in extraordinary instances, vaccinators be paid at first a lower salary than that authorized and gradually promoted as they show efficiency in their work.

"19. *Traveling expenses.*—Traveling expense accounts must conform in all respects to the provisions of Circular F-6, March 9, 1907. Accounts for traveling expenses will be made out by each vaccinator monthly, in duplicate, on Form 8-A, and will be accompanied by receipts on B. H. Form 20, also in duplicate. Vaccinators will be restricted to third-class transportation when traveling by rail or water, and to a moderate amount of baggage in all cases. No transportation expenses will be allowed for vaccinators in traveling short distances between barrios, and after the vaccination of a barrio is commenced no transportation will be allowed, except under extraordinary circumstances, until the vaccination of said barrio is completed.

"Where the hire of carromatas or other vehicles is necessary, two or three vaccinators will ordinarily occupy a single vehicle. Inspectors in charge of vaccinating groups will carefully scrutinize and check each item in the expense vouchers of his vaccinators, seeing that the accounts are properly rendered and that the prices entered are not in excess of those paid by native residents of the locality in which the expenses are incurred. Failure to have complied with these instructions or the approval of excessive or unusual charges will be considered grounds for deducting the excess of overpayment from the salary of the inspector checking the items and certifying to their correctness. The district health officer's certification of the account will be received in lieu of travel orders for travel within the province.

"20. Whenever it is more economical for the government, vaccinators will be expected to walk if the condition of the roads will permit it; in other words, if the salary of the vaccinators for the time consumed in walking would be less than the transportation vaccinators will be expected to walk, unless there is some excellent reason to the contrary.

"21. *Consolidated reports.*—Immediately after the conclusion of each month inspectors will forward to the director of health a consolidated report on Form No. 59, B. H., of all vaccinations and inspections accomplished during the month by their groups, and will note on the bottom of such form the amount of virus on hand on the first day of the month, the amount received during the month, and the amount expended during the month and the amount remaining on hand on the last day of the month. All forms 36, B. H. (stubs), pertaining to each municipality will, when completed, be delivered to the president or the municipal secretary as a part of the permanent records of such municipality."

The foregoing instructions have been found so satisfactory in actual practice that very little friction has resulted. It is perhaps noteworthy to report that no case of loss of life on account of vaccination of these more than two millions of persons has come to the knowledge of the bureau, nor have any limbs been sacrificed, nor has there been a case of very serious infection resulting from vaccination reported.

It is believed that this record is more satisfactory than any that has heretofore been reported with regard to vaccination in any country in the world, and is conclusive evidence of the care with which vaccine is prepared at the bureau of science and also of the rigidity with which the instructions for performing vaccinations are carried out.

PURE FOOD LEGISLATION.

Legislation guaranteeing more wholesome food and purer drugs has been earnestly asked for by the medical profession for many years, and it is therefore most satisfactory to report that the Congress of the United States, June 30, 1906, passed an act, which went into effect January 1, 1907, which had for its object the accomplishment of the above purpose. It is reasonable to expect that no part of the United States will derive more benefit from this legislation than its tropical possessions, and it is confidently hoped that the enforcement of its provisions will result in still further improving the health conditions in the Philippine Islands. On November 9, 1906, the governor-general of the Philippine Islands called attention to this act in a proclamation and named certain officials to enforce its provisions, but later, on the recommendation of the attorney-general, who held that on account of differences between the judiciary system in the United States and that of the Philippine Islands the legal machinery for enforcing the act was not adequate, a new act was drafted embodying all of the act of Congress and making only such corrections and additions as would adapt the law to the Philippine Islands. This bill was passed as act No. 1655, on May 8, 1907, on which date the pure food and drugs act of the Philippine Islands became effective. A committee was appointed by the governor-general, consisting of H. B. McCoy, collector of customs; John S. Hord, collector of internal revenue, and Victor G. Heiser, director of health, and instructed to form suitable regulations for the enforcement of the act. The committee completed its labors in June and the act and regulations

were ready for distribution by July 1, 1907. Owing to the very short time in which the merchants and others have had in order to become familiar with the requirements of the law and the time required to procure chemists from the United States who are competent to make the necessary analyses, up to the present date no active steps have been taken for its enforcement.

The regulations provide that, except for the collection of samples, the enforcement of the law shall be carried out by the bureau of health, with the provisions for appeals to the secretary of the interior. The laboratory work is to be done by the bureau of science. The act and regulations follow.^a

IMPROVEMENT IN HEALTH CONDITIONS IN BILIBID PRISON.

At the time the bureau of health took charge of the sanitation and care of the sick at Bilibid prison, in September, 1905, the annual mortality rate was 238 per thousand.^b

At the end of the fiscal year 1907 the rate per thousand had dropped to 13.5, which shows in a most effective manner the advantage of having experienced medical officers in absolute charge of the sanitation of public institutions, especially when it is necessary to confine a large number of persons in a small space.

MEDICAL SCHOOL.

The movement toward the establishment of a Philippine medical school, which had its origin at the second annual meeting of the Philippine Islands Medical Association in 1905, has met with complete success, and the school is now in actual operation under government auspices. A government building located on the Malecon drive was set aside for this purpose, and the necessary alterations to adapt it for medical-college purposes have been made. The city morgue will be removed to the building, so that any pathological material which may become available through such a source may be utilized for the advancement of science. Adequate light, airy lecture rooms have been provided, and excellent quarters are available for histological, pathological, bacteriological, and chemical laboratories. The first-year class commenced work on June 10 last and advanced classes were started during the first week in July. The course is five years. The curriculum is most complete and compares favorably with that of first-class colleges in the United States. The entrance and graduation requirements are in accordance with the rules and regulations of the Association of American Medical Colleges, which should insure a high standard of education.

The free beds maintained by the government in St. Paul's Hospital and in the new University Hospital, which has recently been opened, are to be utilized by the faculty for the purpose of instruction. In addition, by the courtesy of the officials in charge of St. Paul's Hospital, the out-patient dispensary will also be available for clinical teaching, the medical supplies being furnished by the bureau of health for this purpose. San Lazaro infectious diseases hospitals, Bilibid Hospital, the dispensaries of the bureau of health, and particularly the obstetrical service of the latter, will also be utilized in order to give clinical instruction. The important subject of hygiene is to receive fuller consideration than is usually accorded to it in medical schools. The course will give especial attention to vital statistics, food supplies, municipal and house sanitation, the management of epidemic diseases, and maritime quarantine, and the whole will be made thoroughly practical by making full use of the excellent facilities which the bureau of health and the quarantine service afford for this purpose.

It is also very encouraging to report that the Santo Tomas medical school, which has been in existence for a great number of years in the Philippines, has made extensive alterations in its course during the past year; new teachers having been engaged, new buildings and equipment have been made available, so that, all in all, medical education in the Philippines has received a decided impetus during the past year.

SANITARY REGULATION OF DAIRIES AND DAIRY PRODUCTS.

The sanitary code of Manila makes ample provisions for the sanitary maintenance of dairies and for the inspection and examination of dairy products. It prohibits persons suffering from contagious, infectious, or communicable diseases from working in dairies or assisting in the production, distribution, or storage of dairy products and specifies that all tables, receptacles, and utensils used in the dairies shall be maintained at all times in a cleanly condition and free from all noxious matter. The sur-

^a The act and regulations (act No. 1655) is omitted here, as it is a part of the volume of acts of the Philippine Commission, printed as a part of this report.

^b A chart showing this in detail has been omitted and is on file in the Bureau of Insular Affairs, War Department.

face of the interior walls and ceilings of the rooms of every building used for this purpose shall be limewashed or otherwise covered during the months of January and July of each year, and the woodwork frequently and thoroughly scrubbed. The storage of dairy products has also been a matter of special ordinance regulation.

It is now unlawful to bring into the city or to sell or to offer for sale any milk that is not fresh and wholesome, or that has been watered, adulterated, reduced, or changed, in any respect, by the addition of water or any other substance, or by the removal of the cream; however, milk from which any part of the cream has been removed may be offered for sale or sold if the fact is publicly advertised on the cart or in the place of business of the vender or made known to the purchaser at the time of the sale. Adulterated milk is held to include (a) milk containing more than 12 per cent of milk solids, including fats; (b) milk containing more than 88 per cent of water or fluids; (c) milk containing less than 3 per cent of fats; (d) milk drawn from animals within fifteen days before or five days after parturition; (e) milk drawn from animals fed on any substance in a state of fermentation or putrefaction or any unwholesome food, like digman; (f) milk drawn from cows in a diseased or unhealthy condition, or from cows kept in a crowded or unsuitable place; (g) milk from which any part of the cream has been removed, and (h) milk to which has been added water or any foreign substance whatever.

In order further to protect the milk supply, it is provided that any person or persons owning or having in their possession, or being in charge of milch or dairy animals, the milk of which is to be sold in the city of Manila, shall cause such animals to be subjected to the tuberculin test, to determine the presence of tuberculosis prior to offering such milk for sale or use in the city of Manila.

The fact that milk is such a favored culture medium for most classes of bacteria makes it particularly liable to become the carrier of disease. Milk may also be dangerous because of the presence of disease-producing bacteria received from the animal or from the hands of the milker or from the air of the stable or milk house or from contamination by the utensils in which it is collected and stored. Pure and wholesome milk can only be produced from healthy animals, and even such milk may soon be rendered harmful through carelessness in collecting and storing. The precautions necessary for the production of pure and wholesome milk are numerous and exacting and include such measures as a selection of healthy milk-bearing animals, the strictest attention to their food and quarters, and the absolute cleanliness of the milker and of those who handle and market the milk, as well as the utmost cleanliness of all utensils employed in the dairy and store rooms.

A number of diseases may be conveyed through milk and some may be acquired directly from the animal, such as tuberculosis and inflammatory diseases caused by the streptococcus and staphylococcus pyogenes.

While the positive conveyance of tuberculosis from domestic animals to man is still disputed by some, especially that of bovine tuberculosis through the use of milk and meat of tubercular animals, because of slight morphologic and biologic differences between the bacillus as found in bovine and human tuberculosis, the trend of opinion to-day is toward the belief that milk of all tubercular animals is dangerous to public health. The food supply of milk-bearing animals has an important bearing on the character of the milk. When such animals are fed on distillery products, it is not unusual to find a considerable portion of them suffering from an inflammatory condition of the milk ducts. It has been demonstrated that when milk from animals suffering from this inflammatory condition is given to children it produces gastro-intestinal disorders and is responsible for many deaths. The character of the milk is also influenced by the character of the water, by the surroundings, and by the ventilation. Of the diseases conveyed in milk, apart from those derived from the cows themselves, may be mentioned typhoid fever, cholera, dysentery, diphtheria, and scarlet fever, and, of course, tuberculosis. The milk becomes contaminated through polluted water, by means of flies, or by means of infected hands or clothing of the milkers and others who handle the milk. These diseases are usually classed as water-borne diseases. They are almost as frequently conveyed by milk as they are by water, due to the fact that when the dairy utensils are washed in polluted water, or the milk is diluted with water containing disease germs, or has become contaminated by flies and other insects, every opportunity is afforded for spreading the infection. The only means of insuring safety is to use only the purest milk with which every sanitary precaution has been taken. It is almost impossible to attain this ideal condition in the Philippine Islands, so it is necessary to resort to sterilization.

In order to make it possible for the poorer classes to obtain a milk supply comparatively free from danger, it is necessary that the dairy business should be regulated by municipal ordinances. There is a direct ratio between the character of the milk supply of any city and the infant mortality of that city. The bureau of health has begun

a systematic campaign for purer milk. Under the present conditions only partial success is hoped for, but even this may mean a saving of hundreds of human lives. The following reports of samples examined at the instance of this bureau will show a wide variation in the milk offered for sale in Manila. Of the first 213 samples examined at the laboratory only 131 were fairly good. The milk of the better-class dealers seems to be satisfactory. The small vendors who peddle milk about the streets are the principal offenders, but on account of their being apparently ignorant of the law great leniency has been shown them. In many instances they frankly admit that they add water, cocoanut oil, rice flour, sugar, etc., in order to cheapen it, and they seem much surprised that objection is made. This office has patiently undertaken a campaign of education by having the sanitary inspectors explain the law to the vendors, for it is believed that the time has now arrived when the provisions of law should be rigidly enforced.

There is more carabao milk used in the Philippine Islands than either fresh cow's or goat's milk. Within the last few years there have been increased importations of cattle from Australia and a number of Australian dairies have been established. The price of Australian milk precludes its purchase by the poorer people, who still use carabao and goat milk.

Practically all the butter and cheese used in the Philippine Islands is imported. At the present time this is undoubtedly for the best sanitary interests of the people, who have not yet been taught the art of properly preparing these important articles of food.

The following circulars will give a good idea of the character of the pure-milk crusade in Manila. The first embodies the instructions of this bureau as regards the manner of taking samples, and the second as to the warning notice which is accompanied by a table showing the quality of standard milk:

"APRIL 27, 1907.

"District health officers in charge of health stations:

"You are hereby directed to obtain a sample of milk of not less than 250 c.c. from that sold by vendors in your district and forward the same to the laboratory early in the morning, in order that it may be examined while fresh. One sample only should be collected each day until the milk offered for sale by all dealers in your district has been examined.

"Care should be taken not to request a specimen from anyone who has already furnished a sample to the health officer of another district.

"You will exhibit this circular as your authority for requesting a sample."

"MAY 14, 1907.

"District health officers in charge of health stations:

"Inclosed herewith are copies of the results of the analyses of samples of milk which were recently collected by you, and from the same you will see that the quality of the milk sold by some of the dealers in your district is not what it should be. For your information and guidance there is inclosed herewith a copy of an analysis of what sound dairy milk and sound carabao milk should be. Any marked departure from this standard or alterations of the formula should be brought to the immediate attention of the person selling the same, by letter, which will in effect state the following:

"I have the honor to state, for your information, that the sample of milk which was collected from you, 1907, has been analyzed and the quality found unsatisfactory. You are hereby informed that within a short time another sample of milk will be collected from you, and if, upon analysis, the same is found to be unsatisfactory you will be prosecuted in accordance with law."

"After a letter, as indicated above, has been sent a sample should be collected within a few days, and if the same is found unsatisfactory the vender of the same should be prosecuted in accordance with the provisions of the sanitary code."

Sound dairy milk.

Reaction.....	Feebly acid.
Specific gravity.....	1.0297.
Bacteria.....	Always present.
Fats.....	Average 3.75.
Lactose.....	Average 4.42
Albuminoids.....	Average 3.76.
Ash.....	Average 0.68.
Total solids.....	Average 12.61.
Water.....	Average 87.39.

Carabao milk.

Specific gravity.....	1.038
Fats.....	8.65
Sugar.....	4.19
Proteids.....	5.54
Ash.....	0.85

DISAPPEARANCE OF PLAGUE.

The following sanitary maps show in a most effective manner the success which has attended the efforts of the bureau of health in eradicating plague from Manila.

In 1903 there were 160 cases; in 1904, 94; in 1905, 41; in 1906, 20; while for 1907 there are no cases to report.^a

SCHOOL HYGIENE.

In so much as so large a proportion of the ill health of the community is found in children of school age, and since a large percentage of this ill health can be prevented, the question of school hygiene is of far-reaching importance. It involves the site and drainage facilities of the land, the character of the building, the extent of the cubic and floor space, and the relations of window to the cubic space. It also takes in the question of light and ventilation, water supply, and sewage disposal. There has been more attention paid to the question of school hygiene in the Philippine Islands, especially in Manila, during the last year than ever before. The bureau of health has made joint arrangement with the bureau of education to employ a medical inspector for the city schools. In provincial towns the local health officers make periodical visits, and the district health officer inspects them when he is in the municipality.

The medical inspection of schools has reached the highest development in certain countries of Europe. In Hungary the position of school physician is one of considerable importance, and his duties are clearly defined by legislation. He is expected to examine and study the school buildings from a sanitary standpoint and to investigate the purity of the atmosphere in each room and to analyze it systematically from time to time. He is charged with inspecting the lighting, heating, and ventilation of the entire building and the taking of such measures as may be necessary to prevent overcrowding. He is also required to analyze the drinking water used in the schools and to see that the pupils are furnished with proper seating facilities. With regard to the health of the pupils, it is the duty of the school physician to examine all new arrivals. The examination is of such a character as to afford a permanent record of the condition of each child. These systematic examinations are repeated at stated intervals during the year and a careful record kept of the progress of each pupil with regard to the uniform and healthy development of the body. Considerable progress in the matter of school hygiene has also been made in the United States. The medical department of the Philadelphia high school for girls was established in 1893. Prior to this date the attendance of a physician was an emergency matter. Since the inauguration of the new department the services of a graduate of the Women's Medical College of Philadelphia have been secured, and the hours of attendance fixed at from 9 o'clock in the morning until the close of the session in the afternoon. This physician occupies and performs the duties of sanitary adviser, medical adviser, and general physician, and the effect of her teaching upon the young ladies of this school has been very gratifying. The bureau of health has secured a lady physician, Dr. Anna D. Peck, a graduate of the University of California, for these duties in Manila; and while as yet the work is in a formative stage, results are beginning to show. Doctor Peck has not only instructed the pupils, but the teachers as well. She has lectured before institutes on sanitary subjects, and has held many hygienic conferences on questions which young girls developing into womanhood should know.

The work is new, but a good beginning has been made, which in sanitary matters, as well as other fields of endeavor, is half the battle. To illustrate the importance of medical supervision of schools, it is only necessary to recall the fact that of 5,876 cases of disease found in the public schools of Philadelphia by the medical inspectors during the eight months of the school year 1900, 3,446 were contagious. Among these were 12 cases of diphtheria, 4 of scarlet fever, 112 of measles, 118 of mumps, 869 of contagious school diseases, 397 of conjunctivitis, 20 of whooping cough, 3 of typhoid fever, 2 of tuberculosis, and 8 of scabies or itch. In Manila the results of the preliminary work done during the latter half of the session, which ended in April, were as follows:^b

^a Four maps have been omitted and are on file in the Bureau of Insular Affairs, War Department.

^b Omitted, and on file in the Bureau of Insular Affairs, War Department.

PERSONAL HYGIENE.

The climate of the country is often blamed for conditions directly due to other causes. Indiscretions in diet and neglect to be vaccinated have probably caused more trouble, especially among newcomers, than the climate. About the first thing a timid new arrival does is to go around and secure from as many sources as possible advice as to how he should live. As each installment of this advice is different from all the rest, he very soon finds the kind which suits him best. If he happens to be a man, somebody is sure to advise him that alcoholic stimulation is absolutely necessary. For some reason or another men will take this kind of advice when they will take no other, notwithstanding the fact that experience and common sense both dictate that if there is any place in the world where alcoholic liquors are not desirable it is in the Tropics. In order to place before such people advice upon which they could rely, the bureau has published on cards, for distribution, the following health rules:

"It is easier to maintain good health in the Tropics than in the United States, but in order to do so you should observe the following simple rules:

- "1. Be vaccinated to-day. The bureau of health will do it free of charge.
- "2. Never drink any water unless it has been either boiled or distilled, nor eat any raw vegetables. If you observe this rule carefully, you will probably never contract dysentery, typhoid fever, cholera, or any other disease that originates in the intestines. Disregard of this rule is responsible for the return to the United States of over 50 per cent of the invalids who leave these islands.
- "3. Fruit is wholesome and may generally be eaten raw with impunity, provided it is of a kind that grows upon trees well above the ground.
- "4. Avoid patent medicines. Do not put drugs of which you know nothing into bodies of which you may know less.
- "5. Alcoholic stimulants are not necessary, the advice of 'old resident' to the contrary notwithstanding.
- "6. Generally disease-carrying mosquitoes fly only at night; therefore always sleep under a good mosquito net.
- "7. Finally, observe the same hygienic rules that are applicable to temperate climates, including those of physical exercise."

SUPERVISION OF PILGRIMAGES.

One who is not familiar with the customs of Oriental people with reference to religious pilgrimages can have no idea to what extent the ingenuity of the health authorities is taxed to provide for these great emergencies. These occur at many places throughout the archipelago, but the largest is no doubt that which takes place at Antipolo, Rizal Province. This municipality has a normal population of 2,788, according to the latest census report. During the month of May each year thousands of people visit the pueblo to worship at the shrine of Nuestra Señora de la Paz y Buen Viaje (Our Lady of Peace and Good Voyage), and the daily population often reaches 10,000 or more. Many strange traditions adorn the history of this graven image, and many are those who believe in its miraculous healing power. It has been estimated on reliable data that fully 250,000 people, from every station of Filipino life, visited Antipolo during April, May, and June of this year and transformed for a short time the little village into a town with a large population and without proper facilities for caring for it. The pilgrims make great religious preparations for the event, but little thought is given to the sanitary necessities which so large an influx of people demand. There are serious phases of the situation which require active measures on the part of the health authorities. Every year it is necessary to install an emergency closet system and to send a soldier guard to prevent pollution of the drinking water. The regulation of the sale of food and drink also receives considerable attention, and on account of the great demand for food it is sometimes very difficult to prevent the sale of that which has already spoiled. This year both typhoid fever and dysentery appeared among the pilgrims; but since there was no spread, it is but natural for the sanitary authorities to believe that serious outbreaks were avoided by these prompt measures and perhaps thousands of lives saved.

SANITARY ORGANIZATION IN MANILA.

There are five sanitary districts in the city of Manila, conforming to the number and boundaries of the police districts. Each sanitary district is under the supervision of a district health officer and a force of inspectors, disinfectors, and sanitary police. Attached to each station are one or more municipal physicians and a municipal midwife to attend the poor. While these stations report to the director of health and are

governed by the regulations of the central office, they carry on the details of their work in their own way. They are charged with the supervision of domiciliary sanitation, with the detection of nuisances, and the removal of special causes of disease. The district health officers act as coroner's physicians, render service in emergency cases, and are physicians to the policemen and firemen of their districts. They give advice on sanitary matters and supervise the food, milk, and water inspections. The municipal physician holds clinics and dispenses medicine.

TREATMENT OF OPIUM PATIENTS.

The opium act provides that a certain part of the revenue derived from the taxation imposed by it shall be devoted to the care of such patients as may desire to be cured of the habit. The bureau of internal revenue sent out its agents to talk with the people who were known to be addicted to the use of the drug, and many of them seemed anxious to apply for treatment. This office was notified that the number of patients would reach into the hundreds and was asked to make provisions for them. Accordingly, a contract was made with the San Juan de Dios Hospital, in Manila, and with the Mission Hospital, in Iloilo, to take care of all who applied. So far only 6 patients have been admitted to San Juan de Dios Hospital and 4 to the Mission Hospital. Three of the 6 Manila patients were Americans; the 4 Iloilo patients were Filipinos. The following tabulated statements will show the result of the treatment:

San Juan de Dios Hospital.

Race.	Sex.	Age.	Admitted.	Condition.	Discharged.
American.....	Male.....	39	1906. June 26	Improved.....	1906. Oct. 9
Filipino.....	.....do.....	43	July 3	Cured.....	July 12
Do.....	.....do.....	44	Aug. 18	Improved.....	Aug. 22
Do.....	.....do.....	44	Aug. 28	Cured.....	Sept. 11
American.....	.....do.....	26	Dec. 27	.....	Dec. 27
Do.....	.....do.....	32	.....do.....	.....	Do.

Mission Hospital.

Filipino.....	Female.....	30	1907. Feb. 7	.....	(a)
Do.....	.....do.....	39	Feb. 8	.....	(b)
Do.....	.....do.....	28	.....do.....	Improved.....	.....
Do.....	.....do.....	40	Mar. 2	Unimproved.....	.....

^a Escaped February 26, 1907.

^b Escaped February 12, 1907.

By the terms of the contract they are kept in the hospital for only sixty days.

SANITATION IN PENAL SETTLEMENTS.

One of the most successful efforts that has engaged the attention of this bureau during the year has been the freeing of Iwahig penal settlement, on the island of Palawan, from malaria and the making of the place safe for human habitation. This settlement was begun by the Spaniards years ago, but on account of the excessive death rate caused by pernicious malarial fever it was abandoned. When the question of relieving the overcrowded condition in Bilibid was raised, and it became necessary to find a protected place to which the prisoners could be sent and from which they could not readily escape, attention was naturally turned again to this old settlement, which is favorably located and suitable in all respects, except in the matter of health conditions. It was thought by the application of modern sanitary science the place could be made inhabitable and work was begun with this in view. The results during the first half year were very discouraging, but with the passage of the reorganization act the sanitary control of the settlement was transferred to the bureau of health. It was obvious that radical measures were necessary, hence the first movement was the exclusion of all persons from the reservation who are not under the direct control of the superintendent. The next compulsory measure was the systematic prophylactic administration of quinine in gram doses, as advocated by Koch. The prisoners were lined up and each one was given the quinine and made to swallow it, so there could be no miscar-

riage of the plan. Each prisoner was made to sleep under a mosquito net. All marshy and damp places were drained. In a few months the disease had practically disappeared. There were still to be found malarial-bearing mosquitoes, but as there were no patients from whom they could obtain the infection and transfer it to those who did not have the disease this species became no more dangerous than nonmalarial-bearing mosquitoes. The results of these measures were almost marvelous; in a very short while the number of sick in the hospital dropped from about 80 to 15.

As might be expected, the disease had become chronic in several cases, and these necessitated particular attention, in order that the mosquitoes might not become infected and convey the disease to well prisoners.

By the application of a few principles of sanitary science, what might have remained another "death trap" is now a well-ordered sanitary camp. This office would be unappreciative if it did not mention the great aid rendered, in bringing about this great result, by Major White, of the constabulary, who is now the superintendent of the colony. His work was of the highest order and was at all times characterized by patience, directive genius, and a determination born of a desire to succeed. Great credit is also due to Dr. Florentino Ampil, the physician of the colony, who has been in charge of the sick.

It is not customary to measure human lives by money standard, but if this were done the results in this instance would show that appropriations for health measures are from the first a profitable investment.

THE SANITARY CODE OF MANILA.

One of the first problems that confronted the military authorities upon entering Manila was that of sanitation. The provost-marshal-general appointed a committee to draft such sanitary ordinances as were needed to meet the existing conditions. The ordinances recommended by the committee were put into effect and so far as they went proved most satisfactory. They have been used as a basis for sanitary ordinances by cities in many parts of the Orient and even in America. In order to meet new conditions, the bureau of health recommended the passage of a sanitary code, not for the purpose of repealing the provost-marshal-general's ordinances, but more for the purpose of codifying them and making such changes as experience had shown to be necessary and in order that they might be printed in convenient form for general distribution, so that every resident of Manila might know his rights and his obligations. The commission, as a basis for the code, passed act No. 1150, entitled "An act further defining the powers and duties of the bureau of health for the Philippine Islands and of the municipal board of the city of Manila in connection with the preservation of the public health of that city and repealing certain provisions of law relative thereto." This act provided that, subject to the approval of the secretary of the interior, the director of health, acting in his capacity as the local health officer for the city of Manila, should draft and forward through the secretary of the interior to the municipal board for enactment health ordinances for the said city, and that the municipal board should enact the ordinances so forwarded to it by the director of health, with the reservation that if the municipal board should consider any health ordinance, as drafted by the director of health, prejudicial to private interests or objectionable for other reasons it should return such ordinance through the secretary of the interior to the director of health, together with such amendments as it might deem advisable, and that the director of health should consider the amendments suggested and make such changes in the ordinances as he deemed advisable and return the same to the municipal board. In the event the amendments agreed to by the director of health and approved by the secretary of the interior should not prove satisfactory to the municipal board, the latter was given the right to appeal to the governor-general, whose decision was to be final. It will be seen that, while the initiative lay with the director of health, ample machinery was provided by which the members of the municipal board, representing as they do the people, could be final arbiters. It required a long time to prepare the code and to revise it so as to eliminate the needlessly objectionable features and make it as brief and concise as possible. The sanitary ordinances and regulations of other oriental cities were drawn upon and the conditions of these cities compared with those of Manila, so that such changes could be made as would adapt the text to the local necessities. Such of the provost-marshal-general's ordinances as had proved satisfactory and stood every test were incorporated; ideas were taken from the ordinances of the leading cities of America and Europe, and only in cases where no tested legislation covering the subjects could be found were there new and untried provisions recommended. The code was finally presented to the municipal board and the people accorded a public hearing; protest after protest was submitted; features which had been in working order ever since American occupation and given perfect satisfaction

were declared oppressive, unnecessary, and revolutionary. Ideas which had been incorporated by the Filipinos themselves in local health regulations in many of the municipalities throughout the provinces were pronounced unjust and without precedent. Private interests affected by certain provisions of the code offered their protests. Every objection offered was carefully considered by the board and such concessions were made as were deemed advisable, so that the code as a finished product is rather different from the code as recommended by the bureau of health. However, it is a great step in advance and its enforcement will place Manila on a sanitary equality with the most advanced cities of the world. Provisions have been made for the cleansing, whitewashing, ventilation, and sanitary maintenance of buildings and premises; the prevention of overcrowding; the regulation of plumbing; plumbing materials, house drainage, and the making of openings in the streets; the collection and disposal of garbage and refuse and the removal of night soil; also for the regulation of tenement houses, lodging houses, hotels, and other similar places. The sanitary supervision of bakeries, dairies, public laundries, barber shops, places where food and drink are manufactured or sold; offensive trades and offensive and unwholesome businesses and occupations have been placed under ordinance restriction. The question of water supply has been carefully dealt with and the necessary legal machinery provided for the filling in of lowlands. A chapter dealing with the prevention, reporting, and suppression of dangerous communicable diseases, divided into four parts, has been included. The first part takes up the general suppression and prevention of such diseases; the second deals with buildings and premises infected with plague; the third is devoted to the suppression and prevention of cholera and other dangerous communicable diseases, and the fourth is devoted to leprosy.

The question of sanitation of the harbor of Manila, of rivers, esteros and canals and other waterways, and of vessels has been made the subject of a special chapter of the code, as has been also the destruction of mice, rats, insects, and other vermin. The question of the humane care of the unfortunate persons confined, detained, or kept in any private or public institution of the city of Manila because of sickness, deformity, imbecility, poverty, insanity, or other affliction is fully covered in a special chapter. The code also takes up the question of vital statistics and provides penalties for failure to report deaths and births. The subject of the disposal, transfer, and exhumation of the dead is also completely covered. Nuisances have been defined and the procedure for abating same carefully outlined. One of the most important chapters in the code is that relating to veterinary sanitation. The veterinary division of the bureau of health was transferred to the bureau of agriculture by the reorganization act and made the division of animal industry, but the director of health still retains such supervision over veterinary diseases as may be necessary to protect the public health.

The code was finally enacted October 20, 1906, and went into effect on January 1, 1907. Its usefulness and effectiveness have been considerably lessened by the constant agitation against it, led by certain Filipino physicians who object to the compulsory hospitalization of persons suffering from dangerous communicable diseases. The aim of the bureau of health has been to administer its provisions with due leniency and proper consideration for the local customs. Health officers can not please everybody, and their official duties render it necessary for them to do many unpleasant things. The interests of the public are paramount to the interests of the individual, but this idea seems to be very difficult to impress upon the oriental mind, due, perhaps, to the fact that their religious, ethical, and political training have magnified the influence and power of the individual.

THE PHILIPPINE ISLANDS MEDICAL ASSOCIATION.

The fourth annual meeting of the Philippine Islands Medical Association convened in the library of the bureau of science, Manila, the 27th day of February, 1907, held daily sessions four days, and was the best attended session which has yet been held. The governor-general delivered the opening address before a large audience. A scientific programme had been arranged, dealing almost altogether with original research work. The address of the president, Dr. Paul C. Freer, was entitled "A consideration of the modern theories in relation to immunity." The closing words of this scholarly address, which are significant and worthy of preservation, are as follows:

"The problems to be encountered in immunization are difficult. They involve painstaking experimental work and close reasoning and thought, but, as I have endeavored to show, the modern views of chemistry and physics are all on the side of the worker in immunity; he has but to reason closely to untangle one more skein of the web and his reward is great. In place of the constant fear of recurring serious

epidemics of devastating diseases with their accompanying vast expenses, and in place of the constant vigilance necessary to prevent serious outbreaks of infectious diseases, the worker in immunity may possibly as a result of his studies in the future be able to render a community practically safe from all but negligible sporadic cases. We could then dispense with the rigors of quarantine and its interruption of commerce, or with the loss of life consequent upon the occurrence of epidemics. True, the prejudice against methods of immunization is as yet great, much more of a scientific nature needs to be done, much of a missionary character undertaken, but then not many years ago the very fact of the causation of disease by micro-organisms was the subject of the bitterest dispute and many members of the medical profession itself were skeptical as to the results which were to follow. However, the opposition of the profession has practically disappeared; that of the laity will of necessity follow, and our successors will find the way for future advance cleared for them by the pioneers of to-day."

Official delegates were present accredited to the government of Hongkong, His Imperial Japanese Majesty's Government, and His Imperial Chinese Majesty's Government. Dr. J. M. Atkinson, the honorable principal civil medical officer of Hongkong, attended as the official representative and addressed the association on the subjects of plague and hemorrhagic septicaemia. Dr. Kannosuke Miyajima, delegate from His Imperial Japanese Majesty's Government, read an excellent paper based upon original research work on the subject of the cultivation of bovine piroplasma. His address, which was published in the May number of the Journal of Science, has aroused considerable interest in the scientific world.

Dr. Sia Tien Pao, delegate from His Imperial Chinese Majesty's Government, addressed the association upon the medical situation in China. Doctor Sia is a graduate of an American medical college and one of the most active and enthusiastic workers in the great scientific awakening which is now going on in his country.

Papers presented by local physicians have not been mentioned, but were all of the highest order. It would not be an exaggeration to say that, measured in terms of original search and scientific and practical value, no more important programme has ever been presented in the Orient.

The influence of these gatherings has been a powerful stimulus to research work in the East, and Manila bids fair to become the medical center of the Orient. At the third annual meeting representatives came from Japan, Australia, China, and the United States. A special committee upon foreign guests has been appointed for the next annual meeting, and an increased number of countries are expected to send delegates. The delegates have come in an official capacity, having been invited by the executive branch of the government. This arrangement fosters an official friendliness and stimulates a commendable spirit of rivalry between the scientific men of this part of the world.

PRISON SANITATION IN THE PROVINCES.

The Philippine Commission in passing act No. 1487, abolishing provincial boards of health and substituting therefore district health officers, very wisely provided that it should be the duty of such health officer to prepare and recommend to the director of health regulations for maintaining in a sanitary condition all prisons, jails, theaters, schools, colleges, and other private and public institutions within their respective districts. The first duty enjoined by this bureau upon district health officers, after the change from the old to the new system, was the preparation of sanitary regulations for the betterment of prisons and jails. These institutions, prior to the passage of the act referred to, had been entirely under the control of the local officials; the health officers could advise, but their authority and duty extended no further. Under the new law they have charge of prison sanitation and can see that their advice is followed. The results have been satisfactory, not only in their immediate relations, but especially with regard to their influence in awakening public sentiment along this line.

Santa Cruz, the capital of Laguna Province, has recently completed a new jail, the first in the Philippine Islands built after plans suggested by a sanitary engineer. This office detailed Mr. J. D. Fauntleroy, who was until recently chief of the sanitary engineering division of this bureau, to go to Santa Cruz and assist the local officials with his advice and knowledge, and the completed jail is a monument to sanitary ideas and sanitary progress.

Pangasinan Province will discard its old jail and build another on the same model as the Santa Cruz jail. Pasig, the capital of Rizal Province, has also fallen in line. This municipality is an important trading center for Rizal, Laguna, and Cavite provinces. Its situation at the junction of the Mariquina and Pasig rivers and in the direct line of commerce of the three provinces named makes it a commercial center for the smaller traders.

Through the zealous efforts of District Health Officer G. I. Cullen the provincial jail at Catbalogan has become one of the most sanitary and best kept jails in the islands. At the Tacloban, Leyte, jail a considerable number of improvements have been installed, but there is still room for much improvement.

To the outsider it may seem a waste of time, effort, and money to give the question of prison sanitation so much attention, but when it is remembered that provincial jails are also used to some extent for asylums and poorhouses, and that heretofore they have been alarming factors in the perpetuation of beri-beri and in the spread of tuberculosis, the wisdom of the movement becomes apparent. Beri-beri, which is some times called "the jail disease," because it shows such a marked predilection for jails and prisons, has not been so prevalent in the provincial prisons as formerly, owing to the improved methods in sanitation.

Jails and prisons are reformatory in character. The old idea that they were solely for the punishment of evildoers is rapidly disappearing. Prisoners can not be reformed under worse environments than those in which they lived during their active criminal careers, and since sanitation has a direct moral or ethical bearing on the formation of character it is well worth all the time and attention that thinking people are giving to the subject.

BULLETINS.

Two complete bulletins upon the subjects of tuberculosis (No. 5) and amœbic dysentery (No. 6) were prepared during the year and a sufficient number of copies printed to supply all those who might be interested in the subjects of which they treated. The text was prepared in such a manner that it would be suitable for teaching in schools, and arrangements have been made with the director of education to have the same thus taught throughout the islands. A pamphlet was also prepared which is to be published by the bureau of internal revenue under the provisions of the opium law, which sets forth in a popular manner the evil effects which follow the use of opium.

NEW HOSPITAL CONSTRUCTION.

During the year the efforts of the bureau of health in keeping before the proper officials the inadequacy of the present hospital facilities in Manila and the great need for additional quarters for the care of the sick have received concrete recognition in the appropriation bills of the Philippine Commission. One hundred thousand pesos were appropriated for a new hospital at Bilibid prison; ₱20,000 for the installation of a proper sewer and toilet system; ₱20,000 for the installation of sanitary beds in the general prison; ₱55,000 for the construction and equipment of an addition to the present insane hospital at San Lazaro, to accommodate 250 additional patients, and ₱50,000 for the construction of a new hospital at Baguio, Benguet.

The question of a general hospital for the city of Manila, with plans and estimates, was brought before the Commission during December, but action was delayed until later, so that the matter of a general hospital for the city of Manila, which has been continuously recommended by the bureau of health, has not yet taken definite form. Modified plans and estimates prepared in consultation with a committee from the faculty of the Philippine Medical School will again come before the Commission early in August, and it is hoped that it will be possible to make an appropriation for this purpose, the necessity for which has already been so fully explained in previous reports.

CURATIVE CHOLERA SERA.

During the month of August, 1906, Doctor Denier, a bacteriologist of the Pasteur Institute, Saigon, arrived in Manila and requested permission to test the value of his cholera curative sera, which he has used with such excellent results in cholera cases in Saigon. The matter was brought to the attention of the Commission and its consent to his treating patients at the San Lazaro Cholera Hospital obtained. After about one month's trial, during which Doctor Denier treated 17 patients with his sera, of whom 12 died, giving a mortality of 70.58, he expressed himself as not feeling very much encouraged over the results following the use of his treatment and returned to Saigon. The results in cholera cases treated in the hospital at the same time by ordinary methods showed about the same mortality, so that no improvement over the method in use at San Lazaro was shown.

ARMY BOARD ON TROPICAL DISEASES.

The board composed of Capt. Percy M. Ashburn, assistant surgeon, U. S. Army, and First Lieutenant and Assistant Surgeon Charles F. Craig, appointed by the Surgeon-General of the Army for the purpose of making a study of the tropical diseases

prevailing in the Philippines, has continued its labors and has reported a number of important results. Among other things it discovered a new *filaria*, which has been named *filaria Philippinensis*. This new *filaria* produces symptoms similar to *filaria nocturna*. The board made an extensive investigation into the mode of transmission of dengue and reported that it was impossible to detect any organism in the blood, but that its transmission in all probability was due to the mosquito *Culex fatigans*, which is the principal night flier in the Philippines. Their work was brought to a sudden close by the subsidence of the epidemic of dengue which prevailed at Fort William McKinley, where they were making their investigations.

The board also examined into the question of *Amoeba*, which seriously affects the Philippines, and are of the opinion that they have discovered a staining method by which the *Amoeba coli* may be readily distinguished from the *Amoeba dysenterica*.

The work of these gentlemen has been a considerable stimulus to other scientific workers in the Philippines, and the continuance of such a board can only result in marked good to the islands.

COOLER WEATHER.

The Philippines during the month of January enjoyed unusual cool weather. The weather bureau has noted that January, 1907, was the coldest January and the coldest month since 1857. In the mountains of Benguet, near the Benguet Sanitarium, it has been stated that the thermometer actually registered 28° Fahrenheit. Ice of the thickness of one-fourth of an inch formed in exposed vessels. The temperature in Manila fell as low as 59° Fahrenheit (15° centigrade).

GUARDING MANILA'S WATER SUPPLY.

During the time cholera was present extra precautionary measures were necessary. Realizing that the salvation of Manila depended upon the protection of its water supply against contamination, the help of the military authorities was invoked and this important work placed in their charge. During the epidemic of last year Major-General Wood, commanding the army in the Philippines, at the request of the governor-general, dispatched on June 28, 1906, a detachment of troops to protect the watershed. In order to expedite the enforcement procedures, the Commission passed an act conferring on army officers the prerogatives of peace officers and empowering them to arrest and try those who violated sanitary ordinances and regulations. The municipal board of the city of Manila also passed in advance, as an emergency ordinance, the chapter on water from the then pending sanitary code, thus providing a method by which offenders might be brought before the courts of Manila for trial when it was deemed advisable to take that course.

The military authorities handled the situation with remarkable energy, tact, and success and rendered invaluable aid at a critical time, and due credit should be given them for the part which they have taken in the sanitation of the Philippine Islands.

DRINKING WATER.

The water used in the city of Manila belongs to three classes: Hydrant water, used by the natives generally; distilled water, used generally by the employees of the government, both military and civil; and bottled waters, used by the upper class of natives and richer Americans. The insular cold-storage and ice plant delivers distilled water to all employees of the civil government daily at a charge of 6 centavos (Philippine currency) per gallon. The military government furnishes its employees distilled water free of charge. A comparatively few use boiled water.

This office has been frequently called upon to investigate the cause of dysentery occurring in families using distilled or other sterile water, and in many instances there has been no difficulty in tracing it to careless handling of the ice, which is usually placed upon the sidewalk or upon the floor, and from which place it is taken by the muchacho at his leisure and placed without washing in the water cooler. This has been especially true of the government offices and explains why so many government water coolers are found to contain *Amoeba*. To overcome the source of danger, the director of health has devised and is ready to furnish drawings for a water cooler of simple construction, with a compartment for the ice and another fitted with tubes for the water, which arrangement prevents contamination of the water by the hands of the servants. There is no patent on the invention and it is not a "discovery," it is a simple common-sense device for protecting drinking water.

DISPENSARY WORK.

The bureau of health conducts seven free clinics in the city of Manila, one at each of the five health stations, one at the San Lazaro Hospital, and one at the Civil Hospital. It also maintains three public dispensaries, the general dispensary at the main office, one at the San Lazaro Hospital, and one at the Civil Hospital.

Station clinics are conducted every morning by the municipal physicians, and medicines are either supplied from the stock kept on hand or through the central dispensary.

A limited number of patients suffering from noncontagious diseases, who are unable to pay, are received into the ward of the Civil Hospital as emergency patients. The city of Manila has a contract for 50 free beds in the San Juan de Dios Hospital and 50 free beds in St. Paul's Hospital, and the insular government has recently made provision for 45 additional beds at St. Paul's Hospital. All cases of infectious diseases are taken care of free of charge in the infectious diseases departments of the San Lazaro hospitals. The insane are sent to the San Lazaro Insane Hospital or to the Hospicio de San José, with which the city of Manila has a contract. In addition to these clinical facilities for the poor, the bureau of health supplies medicines to St. Luke's Dispensary, connected with the University Hospital, to the Methodist Hospital, to credited missionaries, and to public school teachers for use among the indigent poor. In such provinces where there are neither drug stores nor private physicians the Commission has adopted a plan which it is hoped will relieve the most urgent necessities of the situation. This plan, which has already been put into operation in the province of Nueva Ecija, is as follows:

The sum of ₱500 was appropriated for the purchase of medical supplies to be handled by the district health officer. These supplies are sold to persons who are able to pay and distributed free to the indigent poor. The margin of profit on the sales is very small, and the money taken in is reinvested, so as to keep up the stock, the object being to make the provincial drug store self-sustaining and at the same time to conduct it without profit. There is no city in the world of the size of Manila that has better free-dispensary service for the poor—a service in which patients are treated with as much consideration as if they were the richest people in the country. The statistical tables published in another part of this report will show the number of patients who have availed themselves of the privileges offered.

The dispensary work is gradually being further extended more and more in the provinces. District health officers have opened small dispensaries at many of the provincial capitals, where poor persons may receive treatment free of charge. Many missionaries are extending medical aid in the different provinces in which they are stationed, and the bureau of health furnishes them medicines for the indigent poor, free of charge, in all cases where satisfactory references are given. In this way more distress is being relieved from year to year throughout the islands.

WATER AND WATER SUPPLY.

Water supply may be conveniently divided into three classes—surface, underground, and cistern. Surface supplies are drawn from streams, lakes, or artificial reservoirs; underground water from wells or other openings into the ground, and cistern water is caught during rains and, if it were not for the collection of atmospheric dust and bacteria in its downward passage and contamination by cistern wells, would be as pure water as it is possible to obtain. After it once comes in contact with the earth it is, strictly speaking, surface water, and as such is subject to all of its impurities. In running over and through the earth it takes up mineral salts and organic matter, gathering most of the former in passing through and most of the latter when passing over the ground. Every part of the crust of the earth is a great filter which removes all of the suspended matter and also removes or transforms most of the organic matter of the water as it passes over the earth's surface, provided the distance traveled is long enough. Underground supplies therefore, unless taken at a depth near the surface or from localities which are subject to special pollution, are generally more free from organic impurities and bacteria of all sorts than are surface supplies, while the latter usually contain smaller quantities of mineral salts. Deep wells in some localities yield water so heavily charged with mineral matter or with gases as to render it unfit for domestic use. Even the water from comparatively shallow wells may be quite hard owing to the excess of mineral matter. Water collected from cultivated fields is apt to contain much organic matter and clay, silt, or sand in addition. Water from forests, meadows, or swamps usually contains much vegetable organic matter.

The most important and the most dangerous source of pollution is sewage. This affects surface supplies far more extensively than underground supplies. Public and private wells are often contaminated by near-by privies or cesspools. Mr. M. N. Baker, an able engineer, writing on the subject, has well said:

"In matters of water supply, above all things else, even the appearance of evil should be shunned; so the first principle of securing potable water is to avoid all supplies known or liable to be polluted and to choose those above suspicion. Where polluted water can not be avoided, every effort should be made to stop the pollution, and if this is not sufficient, then the water must be purified.

"In case a waterworks plant is being established or a new source of supply added, the first object should be to select water of the highest standard of purity. The qualities to be sought are so important that they may be mentioned again: Freedom from disease germs, substances that derange the human system, color, odor, taste, and sediment. The first is of the most importance by far.

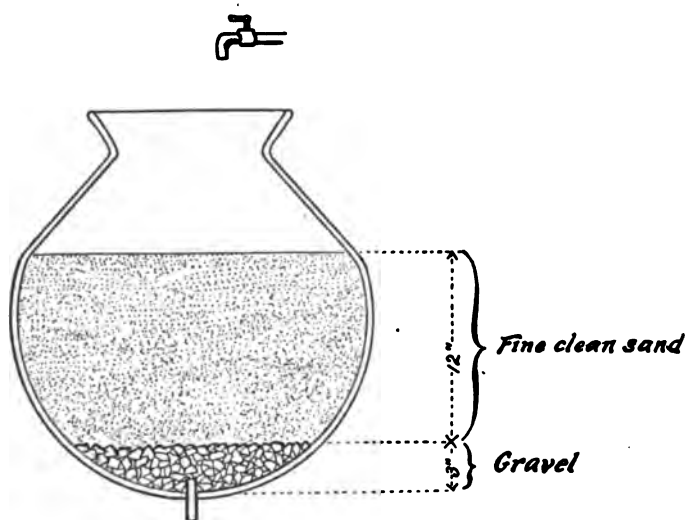
"The ideal plan would be never to choose a water supply into which sewage, however small the quantity, is discharged, and never to allow such discharges into any existing source. It is difficult to carry out this ideal in any case, and the magnitude of the task increases with the size of the supply. We are, therefore, sometimes forced to consider whether some small or remote source of sewage pollution may not be tolerated in order to render an otherwise satisfactory supply available, especially if all other worthy of consideration are much more costly. If the pollution be small, some means of preventing it may often be found; if it is both remote and small, the danger is correspondingly lessened. But where shall the limit be placed? Both individuals and communities are loath to incur trouble or expense beyond a certain point in order to avoid remote chances of danger or death. Each case has to be, and should be, settled on its own merits. Regret it though we may, it sometimes becomes necessary to take some risks, lest the financial burden due to avoiding them be greater than can be borne. There is a limit by law in some places and by local public opinion everywhere beyond which tax rates and bonded debts can not pass. It is less of a burden on one's conscience and far safer for all concerned to urge that no sewage pollution should be tolerated than to name any small percentage of quantity in relation to the total amount of water or any distance at which the admission of sewage could be ignored.

"Fortunately there is always some avenue of escape from death-dealing water. Either a natural supply may be found, pollution prevented by legal measures, purification adopted, or, as a last resort, a dual supply may be provided, pure water in very limited quantities being furnished for drinking and cooking."

The city of Manila has an ordinance regulating the protection of its water supply. In times of cholera epidemics this law has been frequently invoked and in some cases enforced by military authority. Laws for the protection of water supplies are of little value unless backed by the force of public sentiment. The questions involved are often more than local in character. They are sometimes interstate and international in their scope. The prevention of water pollution is a broader question than the preservation of the water supply. Waters not used as sources of supply must be protected from such pollutions as will give rise to offensive odors. It is evident that if all population were excluded from drainage areas there could be no sewage pollution. The attainment of this ideal condition is possible only when the municipality or private company owns or controls the entire drainage area. Birmingham, Liverpool, and Manchester and many other cities in England have bought up all the land in the drainage areas of their water supply. The question has not been given the attention it deserves in the United States and its possessions. Manila has just extended its intake beyond the limits of population, and the entire new watershed is under the control of the government, and arrangements have already been made to guard against its being inhabited. The present watershed is inhabited by more than 10,000 people, on which account the city water is always a source of danger to the health of Manila, which becomes a serious menace when cholera makes its appearance, frequently rendering it necessary to guard the watershed with United States troops to prevent its pollution. When the new system is completed, the necessity for a patrol will no longer exist, because the intake is beyond the limits of populated territory. The engineer in charge of this work reports that the new water supply will probably be ready for use within a year.

The conditions are more serious in the provinces, where the danger of drinking polluted water is not recognized. The bureau of health has endeavored to help matters by urging upon the people the advantage of boiling, distilling, and filtering the water. The masses will not use boiled or distilled water, but have no objection to water which has been filtered. As mechanical filters were entirely out of the question, this bureau

has devised a simple house filter consisting of an ordinary native banga, a jar made of clay, of the size desired, into which is placed 2 or 3 inches of gravel, and on top of this about a foot of clean river sand. The filter should be placed on a stand and under the faucet and a tap inserted in an opening in the lower part of the banga to allow the water to flow out after it is filtered through the two strata of different densities. It is not claimed that this process removes all the danger from the water, but it greatly lessens the number of organisms. It is advisable to pass the water through another filter after it has passed through the preliminary filter. These filters are within the reach of all, costing only a few centavos. They are easily cleaned. Bangas to the Filipino people are what water coolers and water buckets are to the Americans. The accompanying sketch will show the simplicity of the above-described filter:



It was formerly supposed that filtration was purely a mechanical process. It was believed that a mass of sand perfectly inert in itself would in no manner effect a chemical change in the contents of the water, but it is now known that water is purified while passing through a filter by the agency of nitrifying bacteria in the same manner as when passing through nature's great filter, the earth. These nitrifying bacteria take the organic matter and transform it into nitrates. After a filter has been in use some time a thin layer of sticky matter forms over its surface and thin films of the same substance cover every minute particle of the filtering material, especially in the upper layers. It is these layers and films that retain the bacteria. Here the organisms in the water, pathogenic and nonpathogenic, are retained and here most of them perish only a few inches from the surface. Those that penetrate deeper are liable to be caught in the same manner and in addition they suffer through the lack of food, since the organic matter on which they depend for a living has been changed before it reaches them. Thus it will be seen that it not necessary to change the filter's contents as often as might be supposed, yet it is also enjoined that filters should be kept clean. What was once considered a mere straining is now positively known to possess mechanical and antibacteriological properties as well. There are many disease germs which do not multiply outside of the human body, and the problem is that once having passed out to prevent their reentrance into their natural habitat. This is the principal object of all methods of water purification.

It is quite a simple matter to plan the protection of the water supply of Manila, but when the problem is attacked in the provinces it is quite another story. In most municipalities water-closets and privy vaults are practically unknown, the excreta being removed from the ground by pigs. If these pigs could be taught to do their duty, and nothing else but their duty, all would go well, but they wade into the rivers and into the streams, not so much to wash their dirty feet and noses as for the purpose of seeking other fields of filth to conquer. In the season of rains pollution is also carried into streams by the surface water which is discharged into them. To establish a system of waterworks in each municipality throughout the Philippine Islands is impracticable and could not be seriously considered, hence the bureau of

health was confronted with the necessity of devising other means to protect the public. After due consideration, it was decided that artesian wells would come nearer affording the desired protection than any other available agency known. Great undertakings always move slowly, and no one who is familiar with the subject, knowing the financial conditions of the country, would question for a single moment the fact that to supply the 600 municipalities of the Philippine Islands with a sufficient number of artesian wells to accommodate the inhabitants is a stupendous undertaking, yet a start has already been made. Wells are in operation in the provinces of Pampanga, Bulacan, Cavite, and Cebu. In the province of Pampanga very satisfactory wells have been obtained at depths that vary from 100 to 135 feet and which flow at the rate of 20 to 50 liters per minute. Other wells in the same province with the surface at about the same sea level, but bored to a depth of from 180 to 200 feet, have a flow of from 75 to 114 liters per minute, and this amount is not much lessened in the dry season, while the amount from the more shallow wells is greatly reduced during this time.

The mortality in some of the towns which use artesian water exclusively has already dropped 20 per thousand over corresponding periods last year.

The Commission in some recent legislation (act No. 1662) has made it possible for many more municipalities to avail themselves of loans from the insular government for the purpose of installing artesian wells, so that in the near future still further reduction in the mortality can reasonably be expected.

LEGISLATION.

During the year several laws have been enacted for the regulation of questions which concern the health of the people and the interests of the bureau of health. One of the most important local measures from a sanitary standpoint is act No. 1526, entitled "An act for the prevention and suppression of Asiatic cholera," passed August 17, 1906. This act was passed to do away with the dangerous practice, confined almost entirely to Chinese market gardeners, of sprinkling growing garden produce with a mixture of urine, feces, and water, which serves the double purpose of fertilizing and irrigating the soil and satisfies at the same time the celestial's idea of economy. This filthy method, so common in Chinese farming, is a dangerous procedure in the Philippines, and has been the means of disseminating cholera and dysentery. It is now expressly forbidden for any farmer, market gardener, or other person to use any human excreta, excrement, dejecta, or the contents of any water or earth closet, privy, vault, cesspool, latrine, pail, or other receptacle for human feces or urine as a fertilizer on any land on which is grown any article or product intended for food or human consumption, or to allow any human excrement, excreta, or dejecta to be sprinkled on or applied in any manner or for any purpose to any crop, product, or vegetation grown on said land.

Another law which is of considerable importance to small municipalities is act No. 1530, amending the municipal code by giving to municipalities the right to charge a fee of not more than 50 centavos for burial permits and those for the removal of the bodies of deceased persons. The money derived from this source is covered into municipal treasuries and becomes available for local expenses, the item of sanitation receiving its share.

Act No. 1580, entitled "An act making appropriation for certain public works, permanent improvements, and other purposes of the insular government," while not remedial legislation, was of so much importance in the administrative operations of the bureau of health that it merits special mention. This act carried several sanitary appropriations—P10,000 for the extension of the water system at the Cullion leper colony; P20,000 for the construction of a sewer system in Bilibid prison; P20,000 for sanitary beds for the inmates of the said prison, and P55,000 for the construction of buildings and their permanent equipment in the San Lazaro Hospital grounds, in Manila, for the care of 250 additional insane persons.

Another law directly affecting the work of this bureau is act No. 1613, entitled "An act amending act numbered 308 and providing for the establishment of municipal boards of health and fixing their powers and duties." This act provides that with the approval of the respective municipal councils and that of the director of health district health officers may organize any two or more neighboring municipalities into a municipal health district, and the municipalities composing the district may employ jointly a president of the municipal health district, who shall act as president of the municipal board of health of each municipality comprising the said municipal health district and shall receive such compensation as may be appropriated by the respective municipal councils and approved by the director of health.

This act also provides for traveling expenses of municipal health officers, a provision which has never been made before and a lack of which has caused considerable embarrassment to the progress of sanitary work in the provinces. This new law will not

only enable the bureau of health gradually to extend its operations, but will insure a more efficient service. Small municipalities that could not appropriate sufficient salary to employ the services of a physician may by combining to form a municipal health district make available such service.

Other legislation which indirectly concerns the bureau of health and the cause it represents is comprised in acts Nos. 1632 and 1651. The former provides that any graduate of the Philippine Medical School, established by act No. 1415, may upon graduation register his diploma with the board of medical examiners without examination, and establishes for each province one free scholarship in said school, to be awarded on competitive examination to graduates of public high schools. These scholarships are awarded on condition that each student who shall graduate from the medical school with the degree of doctor of medicine, unless he shall receive appointment under the government of the Philippine Islands or one of its branches, shall return to his province and practice medicine and surgery therein for a period at least equal to the time of his scholarship tuition. There has always been a lack of physicians in the provinces, especially in the remote municipalities. This does not mean that there are golden opportunities in the Philippine Islands awaiting American physicians, but that intelligent, well-educated native physicians are in demand—men who know the customs of the country and understand the language of the people and who will practice in the provinces. To supply this demand is the object of the new medical school and of the free scholarships which have been authorized.

Act No. 1651 authorizes that any graduate of a school of medicine or school of pharmacy in the Philippine Islands who shall receive therefrom the degree of doctor of medicine or licentiate of pharmacy shall, upon presenting his diploma from said school to the board of medical examiners or to the board of pharmaceutical examiners, as the case may be, be entitled to receive a certificate of registration without examination, provided such school of medicine or pharmacy shall have been duly incorporated, and shall also previous to the matriculation of said graduate in such school of medicine or pharmacy, as the case may be, have been empowered in writing by the secretary of public instruction, under such terms and conditions as he may prescribe, to grant diplomas and confer degrees in medicine and pharmacy pursuant to section 168 of said act No. 1459: *And provided further*, That such school or schools shall, in the judgment of the board of control of the Philippine Medical School, have brought its instruction in medicine and surgery or pharmacy to the standards prescribed for obtaining the degree of doctor of medicine in said Philippine Medical School, or to the standards of instruction fixed by said board of control for granting the degree of licentiate of pharmacy, as the case may be.

The pure food and drugs law, act No. 1655, has been discussed in another part of this report. The Philippine act is almost a copy of the American law enacted by Congress on June 30, 1906.

The pure food and drugs law is certainly one of the most needed, most righteous, and most important laws that was ever enacted in any country for any purpose, and it is the result of an awakening of the public conscience, which has for a long time apparently been sleeping on its rights and privileges.

Another appropriation act that deserves special mention is act No. 1662, which carries an item of ₱50,000 for the construction of a hospital building at Baguio, Benguet, in accordance with plans and estimates prepared by the consulting architect and approved by the director of health and the secretary of the interior, at a cost not to exceed ₱50,000.

This act under the head of "Artesian wells" created a permanent reimbursable appropriation to the credit of which has been deposited the sum of ₱37,000, appropriated by the act. All receipts which may accrue from insular bureaus, provincial and municipal governments, and other sources on account of services rendered and supplies furnished in sinking artesian wells and, when required, equipping said wells with the necessary pumping machinery, storage tanks, etc., necessary to provide potable water or fire protection, or both, when demanded by the public interest, shall be deposited to the credit of this appropriation. It is provided that the rates charged for the work done by the bureau of public works shall not exceed such as may be necessary to reimburse the appropriation on account of all expenses, including a surcharge to cover the cost of unsuccessful projects for which no charge is to be made.

The artesian-well system has been urged by this bureau as a health measure, and this substantial recognition of its merits practically insures the success of the movement. The question in its sanitary aspects is discussed under another heading.

The Commission in other appropriation acts has dealt as generously with the bureau of health as the status of the financial condition of the country would permit.

The principal sanitary legislation pending before the Commission is a bill for an act providing for the apprehension, detention, segregation, and treatment of lepers

in the Philippine Islands. Heretofore the leper question has been handled under the general powers of the bureau of health as conferred by act No. 157, but in order that the status of these unfortunate people might be more clearly defined it was deemed advisable to present this new act, which pertains more especially to transferring of lepers from their homes to the Culion leper colony. A movement of this kind, as might be expected, always engenders a certain amount of opposition, which can be best met by direct legislation.

A bill for an act regulating the legal status of the insane has also been prepared.

POISONOUS FISH.

The Philippine Islands are bountifully supplied with fish, nearly all varieties of which are wholesome, but now and then reports reach this office of cases of fish poisoning which closely assimilate Asiatic cholera; and as this disease has been more or less prevalent from 1902 until the present year, the opportunity was not favorable enough to justify the time and trouble of a scientific investigation of the subject of fish poisons, so the matter was left open until the arrival of Mr. Seal, of the United States Fish Commission, who was kind enough to cooperate with this bureau in this important investigation. The following are the names of the poisonous varieties found:

Scientific name.	Native name.	English name.
<i>Spheroides lunaris</i>	Botiti.....	Puffer.
<i>Spheroides ocellatus</i>	do.....	Do.
<i>Alutera monoceros</i>	Pacol.....	Filefish.
<i>Tetrodon immaculatus</i>	Boteteng Saguing.....	Tetrodon.
<i>Zonogobius semifasciatus</i> ^a	Biat.....	Goby.
<i>Triacanthus brevirostris</i>	Saltan.....	Hornfish.

^a This species is the only poisonous one. There are many species of good biat sold in the market.

These fish are actively poisonous. The natives, especially if weak and diseased, after eating of them are taken with gradually increasing vomiting, diarrhea, muscular weakness, cold extremities, followed by profound prostration and coma, which, unless actively treated, terminate fatally.

The bureau of health immediately prohibited the sale of these poisonous varieties of fish, since which time the number of the cholera-form cases has greatly diminished.

These fish were known among the fishermen and by many natives to be poisonous, but the commercial instinct was so strong as to induce them to mix the poisonous fish with the wholesome varieties and thus find a market for what otherwise would be an unprofitable product.

As the ratio of the severity of the symptoms is directly proportioned to the amount of poison ingested and the sale of fish so enormous, it was very easy by this process of "mixing" to get rid of hundreds of poisonous fish every day without producing fatalities.

This country is signally blessed in its natural resources. Nature has abundantly supplied it with food, but it remains for those intrusted with sanitary matters to maintain a watchful care over these bountiful supplies and to keep them pure and wholesome in order to protect the public health.

PROVINCIAL MARKETS.

One of the principal sources of municipal revenue is the local market, and until the passage of the district health officer's act the question of sanitation had never been associated with this institution. Markets were places where people could go and sell whatever they pleased and in any manner they pleased, so long as they paid their licenses. The provincial supervisor was the provincial sanitary inspector, but the multiplicity of duties claiming his attention prevented his visiting the remote municipalities oftener than once a year. It was an easy matter to make a show of cleanliness when he was there and to lapse into their old habits when he was gone. Under the new system the sanitary conditions are required to be reported on by the local health officer. These reports are verified as frequently as possible by visits from the district health officer. The improvement has been marked, and the sanitary concept is steadily gaining ground. They are required to keep their perishable food-stuffs covered so as to protect them from the flies, which they have learned to recognize as carriers of disease germs. These little points in sanitation are being continually impressed upon the people, perhaps to the point of exaggeration, but these concepts, however imperfectly grasped, are far superior to the old opinions of disease being due to evil-minded persons, to the visits of black dogs during the hours of midnight, and to bad air in the different organs of the body. Even yet an occasional

cause of death will be registered as air on the brain, or some other impossible cause equally ridiculous. The word "infeccion" is now as frequently seen on death certificates as was formerly the word "calentura" (fever). In other words, the knowledge of the germ origin of disease is gradually becoming known. In all of its writings and publications which are sent to the provinces this office avoids the term "germ theory," for the reason that there no longer can be a "germ theory" now that the germ origin of disease is a recognized potent fact no longer to be disputed.

AMBULANCE SERVICE.

The reform in the ambulance service spoken of in the last year's report has been proved a success in a financial way as well as in convenience. The service has gained in promptness, although the reckless speed has been reduced to the limits of safety and common sense, the apparent loss being compensated for in the system of quick responses which has been inaugurated. This speed question has been subject to much discussion in the United States, and artists have caricatured it in the comic papers and in some of the more respectable magazines. The effect has been to arouse the public interest in the danger of this form of reckless driving, which under the pretext of rescuing the wounded criminally disregarded the safety of all whose business brought them in the way.

The department of sanitation and transportation, under which the service is conducted, has made several improvements during the year; the old Civil Hospital ambulance has been repaired and modernized and all the ambulances bought from the Army have been fitted with rubber tires, so that patients can be removed with ease and comfort. The credit for these improvements is due to Mr. Meham, the chief of the department of sanitation and transportation of the municipal government.

MATERNITY HOSPITAL.

The Methodist Church has completed arrangements for the establishment of a maternity hospital in Tondo. They already have a dispensary in operation and a physician and trained nurse at work among the Filipinos.

CARE OF THE HOMELESS.

The bureau of health maintains by contract a number of aged and homeless people. There is not an almshouse or a poorhouse in the entire Philippine Islands. The Spanish Government and the Roman Church taught the people that it was a sacred duty to take care of their relatives and friends, especially in old age. These worthy teachings have had a profound influence in the transformation of the native character, and it is hoped that the Filipino people may never be educated out of these beautiful ideas.

The average number of indigents maintained at the Hospicio de San Jose at government expense are 89 male insane, 104 female insane, 10 infirm aged males, 40 infirm aged females, 41 young males, 98 young females, or a total of 382.

MARKETS IN MANILA.

The entire management of the markets in Manila has heretofore been under the department of assessments and collections, but will shortly be transferred to the department of sanitation and transportation. On November 1, 1906, the work of market sanitation was transferred to the latter department and two markets selected for trial measures.

Divisoria market, in Tondo, one of the largest markets in Manila—in fact, one of the largest in the Orient—had for a long time been in an unsatisfactory sanitary condition. Chinese vendors, with commendable appreciation of the value of space, had built additions to their stalls until the market presented the appearance of a number of boxes piled one on the other. Under each stall table was a box which had long ceased to serve any purpose, except to hide filth and afford a breeding place for vermin. The Quinta market, in Quiapo, another large market, while not quite so filthy as the Divisoria market, was also in a very unsatisfactory condition when turned over to the department of sanitation and transportation for trial treatment. The new management began its campaign of reform by causing to be removed from the market all structures and fixtures which in any way served other than legitimate market purposes. Cages and platforms erected were removed, so as to admit air and light. The drawers and boxes fastened under the tables were taken out, and every structure or contrivance capable of hiding dirt was removed. At the time the vendors went on a strike on account of a change in the rent for space an excellent opportunity was afforded to carry on the sanitary work inaugurated, and by the time they returned the markets had undergone a complete transformation.

Tables which can be tilted have been installed, so that the entire markets may now be flushed with ease with a fire hose. Considerable improvement has been made in the design for fish tables, so that this business can be handled in a much more cleanly manner. One very undesirable feature, however, yet remains, and that is the practice of renting space in a building which was expressly designed for the sale of perishable products to dry goods merchants, shoe stores, etc.

The chief of the department of sanitation and transportation modestly refers to the markets in his report to the municipal board in the following language:

"The sanitation of various markets was assigned to this department on November 1, 1906. Believing that the food supply of the inhabitants of a tropical city is one of the greatest sources of disease, every effort was made by this department to eliminate, as far as possible, without prejudicing greatly the interests of the market vendors, any insanitary habits or customs which were found to exist."

The improvement in the markets is very gratifying to this bureau and removes a cause of danger and worry. Fresh air, sunlight, water, and vigilance will accomplish wonders in markets as well as elsewhere.

BUREAU ORGANIZATION V. BOARD ORGANIZATION.

There is now on hand the experience and records of one complete year of bureau organization, and it is possible to compare the results with those of board organization. A careful study of the financial statistics will show that more has been accomplished during the past year for a given amount of money spent than at any time heretofore in the history of the health department of the government. It is believed that by doing away with the obstacles caused by unnecessary loss of time due to having a board to convene, lack of quorums, inability to act quickly, the impossibility to take advantage promptly of opportunities that arise, more than offset the greater representation which is given by board deliberations. As a matter of fact, there is probably more consultation with the different divisions of the bureau at the present time than there was at any time during the existence of the board of health. By consultation with the persons most interested and affected by any contemplated action it gives greater representation than heretofore has been the case and, finally, it is a much simpler matter for those who are in authority quickly to fix the blame for any shortcoming in the administration of the bureau.

CEMETERIES.

Probably no duty which the director of health has been called upon to perform has been more trying and exacting than the question of attempting to carry out the provisions of act No. 1458 with regard to the regulation of cemeteries throughout the islands. It requires an amount of time and attention which is out of all proportion to the good which can be reasonably hoped for. The questions which this office has been called upon to decide have not been so much questions of sanitation as they were differences of opinion, which in all probability had nothing to do with cemeteries, but were expressions of animosity, which were injected into reports of cemeteries with the hope that some action would be taken by this office which would be to the disadvantage of the opposing faction. On account of the foregoing the greatest difficulty has been experienced in obtaining a statement of fact in each case and the difficulty of arriving at a just decision correspondingly increased. Naturally no matter which way the decision went in a given case one or the other faction was disgruntled. This is deeply regretted, because it makes many enemies to the cause of sanitation and many projects which are of greater importance from a health standpoint than cemeteries will be defeated by the enemies thus made.

The law requires that this office shall not only approve all new cemeteries before they can be legally opened, but that all old cemeteries must be approved before they can legally continue in use as burial grounds. In order that the work might be accomplished quickly and as systematically as possible, cemeteries were taken up by provinces and district health officers were instructed to visit every cemetery in their district and furnish answers to the following questions.^a

So far the work of inspecting the cemeteries systematically in the provinces of Isabela, Cagayan, Ilocos Norte, Ilocos Sur, Bataan, Pangasinan, Tarlac, Nueva Ecija, Bulacan, Rizal, Cavite, Tayabas, Albay, Ambos Camarines, Capiz, and Occidental Negros is well under way and some cemeteries have been passed upon in every province in the islands. In all there were 582 cemeteries inspected, of which number 272 were approved, 156 rejected, and as to the balance decision is pending.

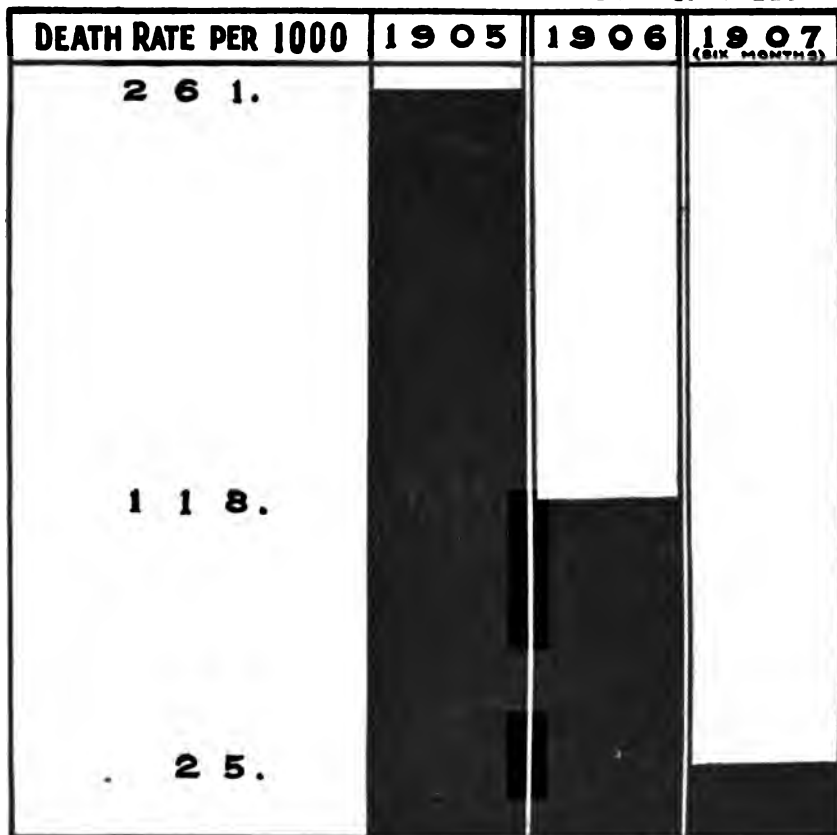
In view of the fact that this work entails an enormous amount of time and clerical work, it will still be several years, with the present office force, before all the cemeteries can be passed upon.

^a Omitted, and on file in the Bureau of Insular Affairs, War Department.

CIVIL SERVICE PHYSICAL EXAMINATIONS.

Since the abolition of the position of police surgeon and the taking over of the work by the bureau of health the physical examinations required by the civil service bureau for entrance into the government service are made at the central office. The positions for which examinations are required include those of the fire department, police department, Bilibid guard service, light-house service, and special service. Applicants are examined with reference to their present condition and their previous history. The special senses are tested and the condition of the lungs carefully examined. Laboratory tests are often made in case of doubt. This work requires considerable time, because it would be absolutely worthless if it were imperfectly done.

**CHART SHOWING REDUCTION IN DEATH RATE AT
THE IWAHIG PENAL SETTLEMENT, PALAWAN,
SINCE THE BUREAU OF HEALTH TOOK CHARGE.**



IMPROVEMENT MADE AT THE IWAHIG PENAL SETTLEMENT.

Probably modern sanitary science has no greater victory to its credit than the eradication of malaria from the Iwahig penal settlement, in Palawan. This site was chosen by the Spaniards many years ago, but, finally, had to be abandoned on account of the pernicious malarial fever which prevailed there. Soon after the inauguration of civil government the site was again selected for the establishment of a penal colony, but satisfactory sanitary arrangements were not made and the health of the prisoners left much to be desired. In 1906 the bureau of health was placed in charge of the sanitation of the colony, and the health conditions since that date are shown in the accompanying diagram.

MOSQUITO EXTERMINATION.

During the year not much work has been attempted in eradicating mosquitoes, for the reason that heretofore the efforts have not met with much success, and it was felt that unless mosquitoes could be economically exterminated from a well-paved section of Manila, like the walled city, that a campaign of general mosquito extermination throughout the islands would not be practicable. Therefore considerable time and attention was given to the study of the problem as to why the efforts in Manila have heretofore been unsuccessful.

An entomologist of the bureau of science examined into existing conditions and made reports and recommendations which gave promise of accomplishing the result hoped for. The suggestions were faithfully carried out, but the mosquito continued his strenuous life and it is only recently that a satisfactory explanation has been found. The extensive excavations which were made for the purpose of installing the new sewer system gave an opportunity to examine many of the old Spanish sewers which were opened during the course of the excavations. It had been observed that at certain seasons, and especially during the dry season, the walled city suffered most from mosquitoes. It was found that the trouble was due to the slow velocity of the water in the storm sewers. In the rainy season, contrary to expectations, the walled city is almost entirely free from mosquitoes. This is explained by the fact that large quantities of water pass through the sewers at this time of the year, and the velocity of the water is such that mosquitoes are unable to breed, whereas in the dry season, no water entering the sewers, the current becomes more and more sluggish until finally the flow ceases altogether and only a series of pools remain, due to the inequality of the levels of the bottom of the sewers. This has, no doubt, been brought about by the frequent earthquakes which have taken place in the city. Such places offer excellent breeding places for mosquitoes, in fact large numbers of wigglers were actually found. Many of these sewers will be replaced by cement drains, which will have better grades, and much relief may be expected in the near future. It is proposed during the next dry season to request the city fire department to flush the storm sewers from time to time and thus obviate the difficulty.

From the foregoing it may be seen that after all there was nothing peculiar about mosquito extermination in the Philippines, and from now on this work will be vigorously pushed, especially in the malarial districts.

NEW SEWER SYSTEM.

Although the construction of a new sewer system for Manila was definitely arranged for a number of years ago, yet it was not until this fiscal year that the work of construction was actually begun. The time now appears to be near at hand when the noisy wagons and the primitive methods in general for the disposal of the major portion of the sewage of the city of Manila will be a thing of the past. The septic-tank system, which has been so largely used in the city and which has proven so very satisfactory, after all has only taken care of a small percentage of the total sewage.

During the year over 14 miles of sewer conduits have actually been laid, and when it is remembered that this included the greater portion of the larger size sewers it will be seen that even much more mileage may be expected during the coming year when the smaller sizes are laid. In all 52 miles of street sewers have been contracted for.

With the completion of the new water-supply system, and the complete installation of a new sewage system, the future improvement in the health conditions of Manila should be even more rapid than they have been in the past, because then it will not be necessary to struggle against the tremendous odds which have confronted the work of the bureau of health in the past.

HEALTH RESORTS.

The Philippine Islands is a land unusually well provided with thermal and mineral springs and attractive regions with high altitudes, at which a complete change may be had. In nearly every province spots can be found that may truly be called natural health resorts, and visitors to many of them are unquestionably cured of their ailments or greatly benefited in health.

These places are not frequented to any extent by the American or European population, except Baguio, Los Baños, and Sebul Springs, which rank in importance in the order in which they are named. Baguio, although only 130 miles from Manila, is meteorologically in another and different world. Here the health seeker will find every natural condition he can possibly desire. As the islands are developed, Baguio is bound to become a great sanitarium center. The civil government has maintained

a sanitarium there for more than five years, and the numbers who avail themselves of the advantages offered have increased each year, the increase being particularly notable during the period covered by this report. The Benguet climate is very favorable for neurasthenic troubles and for the convalescent period of exhausting diseases. Patients suffering from dysentery usually show marked improvement from the first, and rapidly regain their normal condition. This is observed also in nearly all cases of health impairment due to overwork or mental strain. The Army has already established a convalescent hospital, and the demand on it is so great that negotiations have been completed for the erection of another with three times the capacity of the first. The Navy also has taken the matter up, and a report of a special committee recommending the erection of a hospital has been forwarded to Washington. The coming year will probably witness the completion of this hospital, thus bringing the number up to three and this, too, before the establishment of railroad communication.

Los Baños is a beautiful resort situated on Laguna de Bay, a few hours' trip by river steamer from Manila, and is renowned for its thermal springs. Excellent results are obtained in specific diseases and in rheumatic conditions.

Sebul Springs, in Bulacan Province, is an old Spanish resort and still maintains its reputation, especially with the older inhabitants. It is understood that a company is now perfecting arrangements to establish a large hotel at this point.

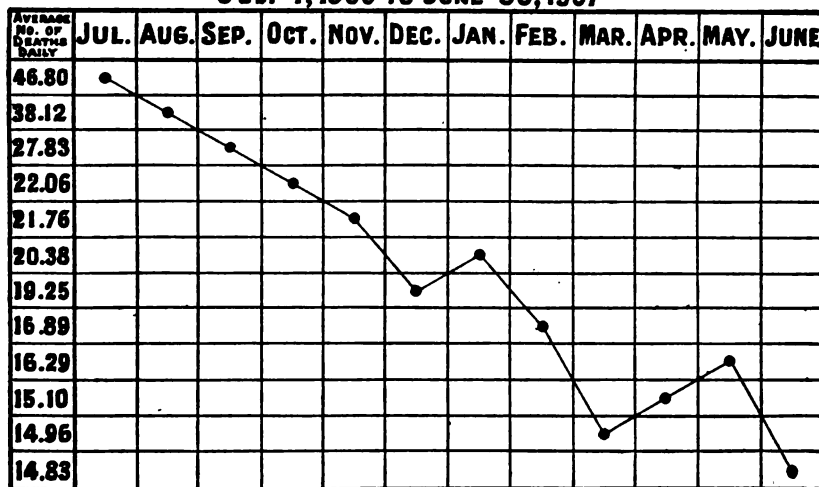
These places will be important centers just as soon as railway facilities are provided.

DECLINE IN DEATH RATE.

The accompanying chart shows in a most striking manner the steady decline which took place in the average number of daily deaths by months in the city of Manila for the fiscal year just ended.

AVERAGE DAILY MORTALITY CURVE FOR THE FISCAL YEAR

1907
JULY 1, 1906 TO JUNE 30, 1907



TRAINING SCHOOLS FOR FILIPINO NURSES.

The bureau of health has entered into a cooperative arrangement with the bureau of education to train young Filipino women who have the adaptability and desire to become nurses, so that they may become qualified to take the places in the hospitals. Some of them show a decided talent in this direction. The Commission has appropriated funds which are to be used for granting a free scholarship to one person from each province. In addition several commercial firms have defrayed the expense of additional scholarships. The plan is to give the girls a two years' course under the supervision of a graduate trained nurse. Special attention is to be given to such features of general education as will be most needful in the study of nursing and also to the domestic science training. The course will be largely practical and to this end a small hospital ward has been provided which draws its patients from the hundred or more inmates of the girls' dormitory. This course is to be only preliminary and the

regular training will be completed in the new general hospital which is to be erected in the near future.

Nursing has undergone a process of evolution and the graduate nurse of to-day is quite a different person from the nurse of twenty or thirty years ago. In days gone by physicians and surgeons never required of a nurse what is expected to-day. Recent years have brought about changes in the methods of diagnoses, treatment, and prevention of diseases. Asepsis alone has revolutionized surgery, but asepsis without a trained nurse to carry it out is impracticable. The preparation, sterilization, and use of the different surgical materials give scope for a display of much intelligence, ingenuity, and resourceful economy. A trained nurse must necessarily know something of bacteriology and pathology in order to carry out the physician's instructions with regard to asepsis and to detect the danger signs in disease. They must understand the art and science of infant feeding and know how to prepare infant foods. It would perhaps not be going too far to say that the lack of local trained nurses is one of the principal indirect factors in the high rate of infant mortality in the Philippine Islands.

The crusade against tuberculosis could be undertaken with more hope of success if Filipina trained nurses were available to instruct the people in their homes regarding the means by which the disease may be prevented.

The nurse is indispensable in settlement work, in district nursing, in public-school sanitation, in tenement-house inspection, and along other lines which it is desirable to instruct people in their homes.

It has been truthfully said that in no other vocation does the true woman show more of beauty and dignity of labor than in nursing. Correct theory and scientific accuracy in general principles and minute details are both desirable, but the true nurse must possess those womanly graces of tactfulness, sympathy, and unselfish devotion to her calling. Skill comes by doing, knowledge comes by study, but the higher attributes come only through careful training and inheritance.

STREET SWEEPINGS AS FILLING MATERIAL.

During the year the use of street sweepings for the purpose of filling in low lands has been frequently permitted whenever it could be done under proper supervision. It is conceded from the outset that the use of this material is not desirable, but the sanitarian in Manila finds himself confronted with this problem; vast areas of the city being at or below the level of high tide, is it better to permit these swampy sections to exist until good filling material can be obtained, which at best will be many years or is it better to put up with a slight nuisance which at most will not persist more than a few weeks and have land at once which drains well and has the other advantages of high ground? Of the two evils the latter has been chosen, with the result that areas of many acres now exist where only filthy swamps were found before. Experience has shown that if the dumpings of street sweepings are promptly covered with good clean earth to a depth of 10 centimeters or more no nuisance is caused. In several instances where this was not done promptly the sweepings made an admirable breeding ground and a veritable plague of flies resulted, the undesirability of which, especially in times of cholera, need not be dwelt upon.

STATISTICAL DIVISION.

For a number of years past it has been the aim to prepare a complete statistical report which would include all the provinces and considerable effort has been made to bring about this result, but thus far without success. The obstacles which have constantly arisen have been of such nature as to prevent the accomplishment of the plan, and the fulfillment of this duty must be left to the future.

The number of births registered during the fiscal year were 7,136, or a birth rate of 31.92 per thousand inhabitants. They will be found classified by sexes, nationalities, legitimates, and illegitimates in a table appended hereto.^a It is believed that the total of 7,136 is really lower than the actual number of births, for the reason that a part of the population, fortunately a small number, still remains loath or indifferent to comply with the law. This belief is based upon the fact that new births are being registered even at the present time by the health stations when the death certificates are presented for approval previous to the issuance of burial permits by the central office, of young children who have not before been reported. It must be mentioned, however, that this tendency is gradually diminishing.

The average 31.92 per thousand expresses what is known as the simple birth rate in the method now universally used for calculating the birth and marriage rates. A

^a Some of these figures have been omitted and are on file in the Bureau of Insular Affairs, War Department.

different method has been devised by certain statisticians to obtain the accurate birth rate of a given community, which is to compare the number of born legitimate children with the number of married women under 45 years of age and the number of illegitimate children with the unmarried women under 45 years. These are factors which can not be disregarded and are necessary when an exact computation of the birth rate is desired.

Eight thousand five hundred and seventy-one deaths were registered, of which 8,251 were residents, or a death rate of 36.91, and 230 transients. The rate of this year has been lower than that of any of the three preceding fiscal years—that of 1903-4 was 49.01; 1904-5, 40.58; and 1905-6, 40.99. Classified by sexes, the total is subdivided into 4,832 males and 3,739 females. According to the census taken at the beginning of this year, the population of Manila is composed of 130,421 males and 93,121 females; the respective death rates therefore by sexes would be 37.04 and 40.15. The high mortality prevailing among the females may be explained as especially due to the fact that there were 97 deaths registered as due to puerperal troubles, a condition of course not found in the males.

Classifying the deaths by ages, we find that there were 891 deaths among children under 30 days of age, 2,167 among those between 30 days and 1 year, and 1,422 between 1 year and 5 years. The deaths among these three groups of ages combined were 52.26 per cent of the total number of deaths, the first group alone representing 10.39 per cent, the second 25.28, and the third 16.59. Among those who died at the age of 90 years and over the death rate was 0.38 per thousand population.

The following table shows the oscillations observed in the infant mortality during the twelve months:

	Under 30 days.	30 days to 1 year.	1 to 2 years.
1906.			
July.....	5.88	21.65	13.63
August.....	6.79	24.14	10.55
September.....	8.62	29.52	7.80
October.....	13.49	28.96	5.39
November.....	14.24	27.00	3.70
December.....	16.29	26.99	4.63
1907.			
January.....	11.93	28.85	5.58
February.....	12.87	25.75	4.22
March.....	12.08	24.16	4.79
April.....	12.46	25.86	6.46
May.....	9.07	21.16	7.45
June.....	12.52	22.45	9.21
Total average for the year.....	10.39	25.28	7.89

Classified by groups of causes, the deaths were as follows:

	Males.	Females.
General diseases.....	1,981	1,324
Diseases of the nervous system.....	1,148	940
Disease of the circulatory system.....	141	77
Diseases of the digestive system.....	544	453
Diseases of the genito-urinary system.....	95	84
Puerperal diseases.....		97
Diseases of the skin and cellular tissue.....	8	
Diseases of the organs of locomotion.....	7	4
Congenital malformations.....	5	1
Diseases of the early infancy.....	248	199
Senility.....	75	137
External causes.....	86	23
Undetermined causes.....	44	20
Total.....	4,832	3,739

For the purpose of completing the study of all the factors which have an influence upon the movement of the population of the city, and as one of them is the number of marriages solemnized and this information is not obtained by the bureau at the present time, a deduction will be made from other more accessible data, viz, as the number of mothers who have borne children for the first time during the year, from which an approximate average of 8.57 per thousand inhabitants is obtained.

The following provincial table is believed to be only approximately correct and it should not be used for drawing deductions: ^a

CIVIL HOSPITAL DIVISION.

The amount of suffering and distress which has been relieved at this government institution during the year can scarcely be realized by persons who have not had occasion to visit the hospital from time to time. Not only have all government employees received medical care, but many persons outside of the government service, on account of the meager hospital facilities in Manila, have enjoyed its advantages. Although the buildings used by this division are entirely unsuited for hospital purposes, the painstaking care of the medical and nursing staff has done much to overcome this shortcoming. There are more highly trained nurses on duty at the civil hospital than at any hospital in the Orient, so that the employee who falls ill at least has the assurance and satisfaction of knowing that he works for a government that has provided facilities for his care which are far above the average.

The results of the treatment of patients have been very satisfactory. There were 1,310 patients treated, of whom 818 were white, 463 Filipinos, and 29 Chinese, Japanese, and other Asiatics. Of this number only 29 deaths occurred, 3 being patients of outside physicians. As 8 of the deaths were those of patients brought to the hospital in a moribund condition, they may be properly excluded from the number of deaths in the institution. On this basis, the death rate would be less than 1½ per cent of the cases treated.

The number of prescriptions filled and refilled in the hospital dispensary was over 8,000, and the number of dressings applied in the operating and dressing rooms was nearly 11,000.

About 1,000 minor operations were performed upon outdoor patients who presented themselves for treatment.

The efficiency of the hospital is considerably embarrassed by lack of suitable quarters. It is hoped that the annual report for the next year may record the assured fact of the long hoped for general hospital of Manila.

Elsewhere will be found a report in detail showing the number of patients treated and with a record of the diseases and mortality.^b

BILIBID SANITATION.

The high death rate in Bilibid prison was a source of mortification to the bureau of health long before it took over the medical and sanitary work of the prison. One of the first moves after assuming this work was to improve the sanitary condition by admitting light and air and to relieve the overcrowding which was believed to be an important factor in the excessive mortality. The death rate was 123 per thousand when the bureau of health took charge. A number of structural improvements have been made, all the drains have been deepened and made semicircular, the level of the ground has been raised, and a system of daily sprinkling instituted. Drinking-water barrels were provided with locked covers to guard against contamination. Rigid inspections were made of all latrines. Prisoners who were sick were encouraged to come into the hospital upon the appearance of their first symptoms. Some months after the introduction of these immediate measures it was reduced to an average of about 75 per thousand and here it remained; it seemed impossible to get it any lower. Like everything else, there was a reason for this. The prisoners were dying with ailments that should not have killed them; their powers of resistance were evidently impaired. The habits and customs of the people with reference to eating immediately suggested a clue and a remedy. The clue pointed to some extraordinary drain on the system. There was plenty of food but imperfect nourishment. To discover the cause, a routine practice was inaugurated and the feces of every prisoner in the prison was examined for the presence of ova of intestinal parasites. These were found to be present in about 60 per cent of all cases examined. Active therapeutic measures were inaugurated to rid the patients of the causes of these debilitating troubles and the result was immediately satisfactory; the death rate fell to about 20 per thousand.

The prevailing diseases treated in Hospital "A," Bilibid prison, were: Ankylostoma, 1,537 cases; amœbic dysentery, 551 cases; acute dysentery, 174 cases; cholera, 18 cases; pneumonia, 62 cases; beri-beri, 60 cases; conjunctivitis, 221 cases, and malaria, 174 cases.

^a Omitted and on file in the Bureau of Insular Affairs, War Department.

^b The statistics in the appendix to this report have been omitted and are on file in the Bureau of Insular Affairs, War Department.

During the previous year only 39 cases of ankylostomiasis were treated, as compared with 1,537 cases during the present year. There have been 551 cases of amoebic dysentery treated, as against 111 cases for the preceding year. These figures do not by any means indicate a greater prevalence of this disease and may be explained on the ground that they were detected by the systematic stool examinations which have been practiced. Among the rarer parasites that have been found are: *Paragonimus westermanii*, 9 cases; *schistosoma japonicum*, 15 cases; *opisthorchis sinensis*, 5 cases; *balantidium coli*, 14 cases; *tenia saginata*, 20 cases; *tenia solium*, 2 cases, and *tenia nana*, 3 cases.

Plans have been drawn for a new sewer system and for new sanitary beds; these improvements, when installed, will further reduce the death rate.

Work will soon be begun upon a new prison hospital, which is greatly needed. With this new building and the completion of the improvements already in progress and a continuance of the same competent medical supervision, there is no reason why Bilibid should not be made the healthiest prison in the Orient.

Every new patient is subject to a routine treatment before he is assigned to a brigade. If these measures could be carried out throughout the city generally, it is believed that the infant mortality would be greatly reduced. Of course, in the very young infants intestinal parasites would not be found, but they suffer nevertheless indirectly from them because of the impoverished condition of their mothers on whom they rely for support. If this office were asked to give the most common affliction of the natives of the Philippines it would unhesitatingly name intestinal parasites.

BENGUET SANITARIUM DIVISION.

The erection of two sawmills, the installation of additional mining plants, the increase in road work, have contributed the usual percentage of accidents and other sickness, which, added to the steady increase in the medical work caused by the constantly augmenting number of visitors to Baguio, have increased the amount of work to be done in the hospital at a much more rapid rate than heretofore has been the case. In addition to the foregoing, the Igorots have taken more kindly to hospital treatment, and their sick and injured have been brought for many miles around to the hospital at Baguio.

The prescriptions filled at the pharmacy show an increase of 55.29 per cent, or 710 more prescriptions filled than last year, which alone is an indication of the growth of the medical work.

Eighty cases of malarial fever were treated at the hospital and the results were uniformly satisfactory, much more so than those cases which are ordinarily treated at lower altitudes. All of these patients came from the lowlands, none of them originating in altitudes as high as that in which the sanitarium is located. The mosquito transmission of malaria theory receives further confirmation in the experience at Baguio, because no anopheles mosquitoes are found there.

The treatment of amoebic dysentery at the hospital met with the same excellent results that were obtained in years past. It has been proved beyond question that frequently a trip to Japan or to the United States can be avoided when this malady resists ordinary methods of treatment in the lowlands.

In addition to the routine work connected with the administration of the hospital and the treatment of the sick, the medical officer in charge, in his capacity as sanitary officer of the province, made many trips of inspection to markets, mining camps, water supplies, etc., and gave the necessary directions for maintaining them in proper condition.

One case of cholera was imported into Baguio, but was so promptly handled that no further spread of the disease took place. An outbreak of smallpox which occurred along the Benguet road was quickly suppressed and practically no spread took place from the time the original cases were discovered.

The work of the division has been seriously handicapped by the poor buildings which had to be used for hospital purposes during the year. It will be remembered that the former sanitarium building was transferred to private persons for hotel purposes and only two cottages remained in which to conduct the hospital work. The appropriation for the new hospital was not made as quickly as anticipated, thus giving rise to great inconvenience and lack of facilities for doing the work properly. This omission has, however, now been supplied, the Commission having appropriated ₱50,000 for the construction of a hospital which, it is thought, will meet all demands which may be made upon it for some years to come. An excellent site has been chosen and it is hoped that within six months the new building will be ready for occupancy.

There were 26 Americans, 2 Europeans, 189 Filipinos, and 48 Japanese, making a total of 264 patients, treated in the hospital, which is an increase of 113 patients, or

nearly 76 per cent over last year. The number of surgical cases treated was 43, an increase of nearly 54 per cent over last year. The number of outdoor patients, mostly Igorots, was 1,371; an increase of over 129 per cent.

The meteorological advantages of Baguio have been spoken of elsewhere. The warmest day of the year was on May 5, when the temperature was 26 centigrade (79½° Fahrenheit), and the coldest was on January 9, when the temperature was 4.4 centigrade (40° Fahrenheit). The highest monthly average or mean temperature was recorded in June, 23 centigrade (73.62° Fahrenheit), and the lowest monthly mean temperature was recorded in the month of February, 9.25 centigrade (48.58° Fahrenheit).

CULION LEPER COLONY.

Mortality.—At the present time there are 739 lepers at the Culion leper colony. The mortality during the year has been high, which may be ascribed to the miserable physical condition in which the lepers were found at the time they were gathered from their respective provinces. The great majority of them were beggars who eked out a miserable existence begging on the streets, from house to house, or existing on such charity as might be bestowed upon them. Large numbers of them suffered from gangrenous ulcers. Before their arrival at Culion, a number of them were afflicted with beri-beri, and the weakened condition in which many of the others were found made them ready prey to this disease. It is not believed, however, that the transfer of the lepers to Culion in any way hastened their end, but rather, that life was prolonged in many instances owing to the medical attention given and the excellent food which is furnished. It was simply a question of the survival of the fittest and among those remaining in this group death is comparatively infrequent. They are healthier, stouter, and generally more robust than when they were received, and many of them bid fair to live a long time. The deaths, by months, were as follows:

1906.		1907.	
July.....	45	January.....	23
August.....	48	February.....	12
September.....	39	March.....	13
October.....	26	April.....	19
November.....	36	May.....	17
December.....	36	June.....	23

Thus, for the first six months there were 230 deaths and for the last half of the year, 107. In view of the fact that the colony during the latter portion of this period had almost double the population it had during the commencement of the year, the great reduction in the death rate will be apparent.

Practically all gangrenous ulcers, by proper medical attention, have healed and the number in the hospital from other causes has been gradually reduced. The deaths among the lepers were due principally to gangrenous septicæmia, beri-beri, tuberculosis, or general debility.

On February 28 a mild case of smallpox attacked a young girl of the colony. Isolation and quarantine were maintained for a month, subsequent to disinfection. Vaccination of all the lepers of the colony and also of the nonleper employees was performed, with the gratifying result that no other cases developed, which fact again speaks for the efficiency of vaccination as a preventative of smallpox. In this case, it is quite interesting to note the result of the vaccinations. In the lepers we had practically virgin soil; some had been vaccinated during the Spanish régime, but the majority had not. Many adult lepers had not been vaccinated because of the very fact that they were lepers, and also leprous children were passed for the same reason by provincial vaccinators. Thus, with good fresh virus it was interesting to watch results and compare the percentage of takes in the lepers under these conditions, and of the nonlepers, employees, among whom there were many laborers who had never been vaccinated. The number of takes among the lepers was as large as that in healthy subjects and in no particular could it be said that leprosy modified the effect of the vaccination.

The source of infection in this one case is not quite clear. None of the lepers had come in contact with persons from the outside world for several months. It is believed that the contagion came in some textiles which were sent to Culion by friends residing in infected districts.

Discipline.—The behavior of the lepers has been good. Among the 1,000 inmates during the year, but one serious offense was committed and that was on the day of admission, which was November 1, 1906; a man stabbed his wife three times with a bolo, but though the wounds were of a grave character she eventually recovered and her

husband was sentenced to six months' imprisonment and to be deprived of his gratuity indefinitely. A few minor offenses have occurred and suitable punishment administered. Eighteen lepers at various times have attempted to escape. All but three have returned or been returned. Two groups of five each succeeded in reaching Cuyo, in a small open boat, but were apprehended by the constabulary and returned on the leper boat.

Subsistence.—The subsistence furnished has been excellent in quantity, quality, and variety. Four beeves were consumed per week, the same being inspected and slaughtered at Balala. Other food consists of rice, mangoes, beans, fideos, salmon, cod-fish, tomatoes, lard, coffee, sugar, milk, salt, garlic, pepper, vinegar, and fresh fish caught by themselves. The lepers have requested that fresh vegetables be furnished them, but these they might easily raise themselves and probably will do so to a small extent this rainy season. Seeds have been given them and permission to plant at Baldat and Toboc.

Productive labor.—It is very difficult to accomplish any work with the lepers; many are reasonably strong robust persons who, as yet, are able to do considerable work if they wished to do so. It is true that the majority are debilitated, more or less always ill, easily fatigued, and could accomplish nothing; but the majority of those who could work are lazy and indolent, and as long as they are clothed, fed, housed, and receive a weekly gratuity of 20 centavos, from the government, they do not take kindly to any form of manual labor, and it is even with difficulty that the ordinary work of cleaning up their premises is accomplished.

Births.—During this year there have been six children born at the colony, three of whom survive. In four of the cases the mothers were pregnant before arrival at the colony, the other two are Culion children, born out of wedlock. This brings up probably the most difficult problem to handle under the existing conditions—the separation of sexes. There are some 89 houses on the colony of varying accommodations, all located within a radius of some 500 yards, thus bringing the people in close contact nearly all the time. The houses have been numbered and certain ones designated to be occupied by males and others by females, except in the case of a family of different sexes which may be permitted to occupy the same house when it can be satisfactorily arranged. At night the separation is not believed to be satisfactory. The police and others who are depended upon to carry out instructions regarding this matter are but human themselves and can not be depended upon to keep the inmates in their respective quarters.

The missionary work which is done among the lepers by the two members of the Jesuit order and the Sisters of Charity on duty there have no doubt had an excellent effect.

In order to give these unfortunates the greatest measure of liberty, they are permitted to roam about the island at will during the daytime, so that additional opportunities for the meeting of the sexes are possible even though absolute separation could be enforced at night.

The question of the separation of the sexes has received the most serious consideration from the highest to the lowest official who is in any way connected with the care of the lepers in the Philippines and while there is no unanimity, yet the consensus of opinion undoubtedly is, that while the undesirability of the commingling of the sexes is fully appreciated and greatly to be deplored, yet judging from the customs and habits of the people it is thought that the complete separation of the sexes is impracticable, if not impossible. The remedy lies rather in persuasion than in the application of force and it is believed that the former will yield the best results. It is a moral question and since the government of the colony is made to conform as closely as practicable to that of the ordinary Philippine town, it would appear that the management of this question should be left to the persuasive methods of the church.

Children.—It has about been decided to build a suitable house in the nonleprous portion of the colony for the care of such children as are born at the colony, where they would be cared for by the Sisters of Charity.

Improvements.—The regular employees of the colony with practically no outside assistance made many improvements during the year and in consequence the appearance of the colony has been much enhanced.

A fill was made near the quarters of the nonleprous employees, and a large bodega erected thereon. The new gravity water system with its pipe line of more than a mile in length which leads from a reservoir back in the hills has been completed and more water is available for the colony than can possibly be used. A large lighter was built for unloading freight. The construction of steps and proper walks is well under way. A house for the assistant physician is under construction. All buildings have been repaired where necessary. The nipa houses used by the lepers are being repaired

by themselves with nipa which was furnished them. Changes were made in some of the water-closets. Considerable painting and whitewashing was accomplished.

During the coming year, it is proposed to build an addition to the hospital and to erect another bodega so that the buildings which are now used for that purpose may be used for living quarters for lepers. The construction of nipa houses will be steadily continued. Plans for a new building for nonleprous children are now being prepared.

SAN LAZARO HOSPITALS DIVISION.

This division comprises the smallpox, plague, cholera, and leper hospitals, the hospital for the insane, the morgue, and the crematory. In all of its hospital departments 488 patients have been admitted during the year, 308 of whom were remaining on June 30. One of the principal benefits accruing from conducting these different institutions under one management is economy. The daily cost of subsistence for the year has averaged about 34 centavos Philippine currency, which, considering the character of the food which has been provided, is remarkably low.

Insane department.—The insane department has been somewhat overcrowded, but in January of the present year the construction of a new ward, which will accommodate 250, was begun. It is now almost completed and will be ready for the reception of patients August 15. The new building is of reinforced concrete, and is practically fire and earthquake proof. With this increase in the facilities of the department, accommodations for 350 insane persons will be available. The male inmates have been occupied a portion of the time in cultivating vegetables, and the female inmates have rendered much assistance in doing much of the sewing that is required for the different divisions of the bureau. The majority of the males do not take very kindly to physical work and much persuasion is often necessary.

Leper department.—At the close of the fiscal year there were 129 male and 87 female lepers remaining in the hospital, and a happier and more contented lot, so far as lepers go, could not be found anywhere.

A new X-ray apparatus of the latest design has been installed, and by its mere presence alone has done much to make the lepers better satisfied, because they feel that efforts are at least being made to cure them of a disease that has been considered incurable heretofore.

With the kind gift of a Spanish resident, instruments were purchased and a leper orchestra was organized, which furnished considerable diversion for a time, but unfortunately the fingers of the players soon became so abraded and sore that the string instruments had to be discontinued.

Cholera, plague, and smallpox departments.—The plague and smallpox wards have been very little used. The cholera ward has practically been closed since October of last year. At the close of the fiscal year these three wards were empty.

Morgue.—During the period covered by this report, 835 bodies have passed through the morgue, most of them being sent there to be buried free of charge as pauper patients by the city. It is now the practice not to cremate except when requested, owing to the opposition to this method of disposing of the dead.

(The statistical tables for this division will be found in the appendix.)^a

CLERICAL DIVISION.

The work of the clerical division was often seriously handicapped during the year owing to the various changes in personnel, the necessity for employing temporary employees to replace those on leave and to the expansion of the bureau.

At the present time among the American employees there are but two in the division who were there at the beginning of the fiscal year, and of those present now, including the chief of the division, none have been employed for a complete year. From the foregoing it may be seen that the experience of this office corresponds closely to that of nearly every bureau of the insular government—increasing difficulty in securing and retaining the services of trained employees. The majority of them resign and return to the United States, where they usually work for lower salaries than are paid here. This question is becoming serious and should receive attention at once.

The law which changed presidents of provincial boards of health and made them district health officers and therefore employees of this bureau occasioned an enormous amount of correspondence; the constant increase in the number of inmates at the Culion leper colony; the passage of the recent act which provides for the consolidation of municipalities into municipal health districts; the changes made in the license law; the several hundred additional vaccinators who were employed during

^a These have been omitted and are on file in the Bureau of Insular Affairs, War Department.

the year, a record of each one of whom is kept; the increase in the number of insane at present being cared for by this bureau; the new cemetery law, which provides that every cemetery in the Philippine Islands must be passed upon, and the many other duties which have been added to the bureau of health have placed an enormous amount of additional work upon this division. It is therefore very satisfactory to report that there has been practically no increase in the clerical force, the work being handled by the number of employees who were authorized last year.

It is believed that more overtime work has been done and more accomplished with less employees than was the case in any other bureau of the government.

(The financial statement will be found in the appendix.)

SANITARY ENGINEERING DIVISION.

The work of this division has been considerably interrupted by a change in engineers, Mr. J. D. Fauntleroy having resigned to enter the Reclamation Service of the United States. Practical operations in Manila were suspended almost entirely during the months of December, January, February, and March. In December the energies of the division were directed to closing up the outstanding orders so as to be ready to begin the work of the new year under the sanitary code which had been passed to go into effect on January 1. The other three months' delay was occasioned by the groundless protests against the new legislation. The press had so excited the people that it was deemed best to hold all work in abeyance until they had time enough to see that they were being misled, and the code itself was no stricter than the scattered ordinances which had regulated these matters for many years.

The scope of the work of the sanitary engineering division covers the entire islands and more and more attention is being paid each year to provincial work.

The various styles of septic vaults which have been evolved as a result of the experience gained since the American occupation have now been so perfected and have given such uniform satisfaction that it has been deemed advisable to include in this annual report a drawing of each style. The diagrams and instructions which are sent out to contractors are as follows:^a

(Statistical tables showing work accomplished in Manila during the year appear in the appendix.)^b

PROPERTY DIVISION.

Although the demands upon this division have increased enormously, the personnel has remained the same as last year. Property which amounted in value to nearly ₱100,000 was received at the main storeroom and carefully checked upon its receipt, errors were frequently detected and substantial savings made by the business-like manner in which the work was carried out. Subsistence supplies to the amount of ₱144,557.07 were purchased and their delivery supervised in Manila or the shipments made when they were for the provinces. The selection of supplies to the amount of ₱22,407.10 was made and their delivery arranged direct from the warehouse of the seller to the division of this bureau for which they were intended, and when it is remembered that these purchases were largely composed of innumerable small items, like the selection of ligatures, the size of needles, the length of probes, the shape of knives, etc., the painstaking care required will be fully appreciated.

The purchase of supplies through the property division has continued to give most satisfactory results. The experience gained last year, added to the knowledge which has been acquired during the period covered by this report, has enabled the bureau to save thousands of pesos over what has been paid heretofore for similar supplies. The greatest attention is constantly given to prices current in the local market, and when the cost is favorable advantage is taken of such circumstance, and it has happened frequently that the knowledge that this bureau had of low prices was also

^a The following diagrams of vaults, with accompanying specifications and instructions as to their construction, have been omitted from this report and are on file in the Bureau of Insular Affairs, War Department:

Tight vault for houses of two or more stories.

Septic discharge vault.

Absorbing basin.

Septic absorbing vault.

Gravel filter discharging catch-basin.

Tight vault without seats.

^b These have been omitted and are on file in the Bureau of Insular Affairs, War Department.

furnished to other bureaus, so that the savings made not only accrued to the benefit of this bureau, but were participated in by the government as a whole.

Two million seven hundred and eighty-five thousand four hundred and seventy-five units of vaccine virus were forwarded to the provinces, which were divided into 497 shipments. This work was handled most satisfactorily, and the vaccine reached its destination in better condition and more promptly than has ever been the case heretofore, notwithstanding the fact that more and more inaccessible regions of the Philippines had to be reached during the past year. By keeping a careful supervision over the drug stock on hand, the old stock which was bought years ago has been almost entirely closed out without loss to the government, and the care which has been exercised in only keeping on hand such drugs as are not likely to spoil and for which there is a constant demand also resulted in a material saving.

Four hundred and thirty-six requisitions were filled and forwarded to the provinces and to hospitals and health stations in Manila. One hundred and seventy-six remedy packages, ranging in value from ₱5 to ₱25 were prepared and disposed of as follows:

Sold to individuals or other bureaus.....	78
Issued to indigent persons.....	59
Remaining on hand.....	39

Much time was devoted to the repair and care of public property and many articles made serviceable for a number of years longer on account of having received timely attention.

INSPECTION DIVISION.

This division was nominally organized September 29, 1898, but was restricted in its operations until the dry season of 1901, when it was enlarged solely for the purpose of combating a threatened plague epidemic. Upon the appearance of cholera in April, 1902, it was enormously increased by the employment of a large number of emergency inspectors, about 7,000.

The division now consists of 35 district health officers, of whom 5 are on duty in Manila; 7 sanitary inspectors, of which number 6 are on duty in Manila; 12 assistant sanitary inspectors, all on duty in Manila. The ambulance corps, the municipal pharmacy, and the disinfecting corps are also branches of this division. The municipal sanitary inspectors in the provinces are not included in its personnel, though it exercises indirect control over them.

The passage of the pure food and drugs law and the inspections required by the sanitary code in Manila have greatly increased the duties pertaining to this division, which was already charged by law with making regular inspections of work of municipal boards of health, of the work of all employees of the bureau of health, of the cleaning of the sewers, streets, walks, alleys, public squares, and parks; of the collection and disposition of garbage and dead animals, night soil, and contents of cesspools, and of the sanitation of houses, factories, mills, schools, prisons, dairies, markets, meat shops, bakeries, public water supplies, public bath houses, wells, cisterns, cemeteries, undertaking establishments, asylums, jails and barracks, poorhouses, theaters, and all public institutions and places of public resort.

From the nature of the duties imposed upon this division it will be seen that it is a medium of communication between the public and the administrative direction of the bureau; hence it has been necessary constantly to insist upon the observance of uniform courtesy and forbearance on the part of its employees. The enforcement of health regulations has ever been a source of annoyance to the people, but the success with which this division has avoided serious complications and embarrassments testifies to what may be accomplished by a policy of courtesy and kindness.

In Manila the sanitary inspectors' section of this division made 560,168 inspections of houses during the year, and have caused 82,814 house-cleaning orders to be executed. As a result of these inspections, there were also 36,902 yards and 718 cesspools cleaned. Three hundred and twelve samples of food and drinking water were collected and sent to the laboratory for analysis.

The statistics for many other results accomplished will be found in the appendix, but it is impossible to represent the amount of work performed in figures alone, as a large part of it is of such a nature that no record can be made.^a

During the year there were 5,331 disinfections made. A disinfection may mean simply a disinfection of the premises or it may mean the disinfection of almost everything found upon the premises, as well as wearing apparel, cooking utensils, bed clothing; in fact, everything that could be the medium of conveying germs of disease.

^a These tables have been omitted and are on file in the Bureau of Insular Affairs, War Department.

THE BOARD OF MEDICAL EXAMINERS.

During the year the board of medical examiners registered 13 doctors of medicine, 6 licentiates of medicine, 27 cirujanos ministrantes, and 2 midwives, making a total of 48. Of this number, 7 doctors of medicine, 5 licentiates of medicine, 22 cirujanos ministrantes, and 7 midwives were registered by examination, and the remainder by reason of having been in the islands prior to the passage of act No. 310.

The total receipts of the board were ₱860 and total expenses ₱356.88, leaving a credit balance of ₱503.12, which was covered into the treasury of the Philippine Islands.

Attention is called to the fact that 27 cirujanos ministrantes or practicantes were registered during the year, while the number of physicians was only 19. A cirujano ministrante is not a physician nor is he a trained nurse, and it is unfortunate that the law gives him a legal status. With two medical colleges in the Philippine Islands, the time has certainly come when he can be eliminated from the field of medicine. Therefore it is recommended that act No. 310 be so amended that the board of medical examiners will not be required to license cirujanos ministrantes in the near future.

Fewer flagrant violations of the medical-practice act have come to notice during this year than in any year since its passage. The board has never been sure of its position with reference to cirujanos ministrantes or undergraduates in medicine. In Spanish times these people acted as assistants to physicians; that is, they acted more or less in the capacity of nurses; not trained nurses, because they never had the training. It is believed that it would be better to let those who have already registered practice as physicians in remote municipalities and discontinue from now on the title of cirujano ministrante, as it is generally called, or practicante in medicine.

THE BOARD OF DENTAL EXAMINERS.

Nineteen meetings were held during the year and six applicants presented themselves for examination, two certificates having been issued to graduates and one to a cirujano ministrante. Among the dentists registered was a graduate of the dental department of the Washington University, St. Louis, who is the first Filipino dentist to graduate from a college in the United States since American occupation. A Filipino member of the board of dental examiners graduated from the University of Pennsylvania before the Spanish-American war and has been practicing continuously in the city of Manila, except during the time he was studying in Paris and other European cities. It is understood that several young Filipinos are studying in American dental colleges and will soon return to the islands to engage in practice.

The board reports that there have been no violations of the dental law during the year of sufficient importance to necessitate prosecution.

There were collected from all sources ₱80 and expended for all purposes ₱344.

BOARD OF PHARMACEUTICAL EXAMINERS.

This board has held two examinations during the year, as required by law, the first on July 3, at which 17 applicants presented themselves, and the other on January 2, when 20 applicants were present, making in all 37 applicants during the year. Out of this number only two were successful, a percentage of a little less than 5%. In explanation of why so few of the applicants were successful in the examination, it may be stated that the requirements of the board, so far as practicable, are made to conform with the standard of American pharmacy and that with most of the candidates the practical experience or the theoretical knowledge was deficient. Those who seemed to have the one lacked the other. The members of the board, two of whom are Filipinos, are to be commended for their efforts to elevate the standard of the profession of pharmacy.

The board issued 37 apprentice certificates and 8 temporary certificates without examination, and collected from all sources the sum of ₱962 and expended for all purposes ₱596, leaving an unexpended balance of ₱366, which has been covered into the treasury.

EXPENDITURES.

At the close of the last fiscal year the unexpended balance from the appropriation for the previous year's current expenses (₱125,487.20) reverted to the treasury. The amount available for expenditure for the fiscal year just closed was ₱1,048,000.

The total expenditures authorized from the current appropriation bills was ₱885,719.24, leaving an estimated balance of ₱163,719.24 which will revert to the treasury.

These figures are perhaps not absolutely accurate because the cost of supplies yet to arrive from the United States and the amounts of the bills contracted during the latter part of the fiscal year are not yet known and can only be estimated.
(Detailed financial statement will be found in the appendix.)

CONCLUSION.

From a sanitary standpoint the year covered by this report has been a successful one, successful not only because it has been practically free from the devastating influence of epidemic diseases, but because of the progress that has been made along the lines of real, effective sanitation, and the administration has proved sound from a business standpoint. It is believed that the amount spent this year has produced greater results than any similar amount during any year previous. Lives that have been saved if measured in terms of commercial value would reach an enormous amount, but when measured in relation to their value to the body politic, especially when such relation is affected by the conditions of an underpopulated country, the results are beyond human calculation. Heretofore the best efforts of this bureau were necessarily expended on Manila and municipalities, not far removed, but as the work has become more systematized it has become practicable to extend scientific methods of sanitation to the more remote districts. The importance of the work becomes apparent when comparisons are made with nearby oriental countries. The conditions for the spread of plague are as favorable in the Philippine Islands as they are in many parts of India where it is raging with great severity. The inhabitants of the Philippines are no more immune to cholera than are the inhabitants of Bengal. Why is it that the country is not decimated by devastating epidemics of smallpox as are certain parts of China? The only available explanation, so far as this office knows, is that eternal vigilance, which is the price of success, has been observed:

The newspapers are not yet through praising the results gained by the sanitary methods adopted by the American Government in Habana during the early part of the American-Spanish war. These measures were indeed successful and deserve all the compliments they have received, but it should not be forgotten that they were brought about under very favorable auspices; that the country was under military rule and that the orders of the health officer were supported by the prestige of martial law. The Cuban politicians and the opposing press were for the time silent; sanitation was the order of the day and no excuses were taken; no lawyers to contest in court; no restraining orders and no legal obstacles. Large sums of money for sanitary purposes were appropriated in Cuba while in the Philippine Islands only small amounts were available for sanitation. The results here have been brought about on different lines; every effort that has made for progress has been obstructed by meddlesome opposition, and every advance has been sharply contested. Perhaps in the long run it will all be for the best, and the results may be of a more permanent character than if they had been gained with less effort. It has been a campaign of education, patience and persistence.

Reference to the statistical tables in each succeeding annual report, will show a steady decrease in the dangerous communicable diseases since American occupation. While they show the success that has been achieved, they do not record the hard work, the discouragements, the faithfulness and efficiency of those to whom the credit is due—the employees of this bureau—therefore it remains for the director of health publicly to acknowledge their part in bringing about what he believes to be a successful issue.

Very respectfully,

VICTOR G. HEISER,
*Passed Assistant Surgeon, United States Public Health
and Marine-Hospital Service, Director of Health.*

To the SECRETARY OF THE INTERIOR,
Manila, P. I.

APPENDIX.

STATISTICAL TABLES—BUREAU OF HEALTH.

GENERAL STATISTICS.^a*Population of the city of Manila.*

[Health census of 1907.]

Nationality.	Population.	Nationality.	Population.
Americans.....	5,199	Chinese.....	18,028
Filipinos.....	195,292	All others.....	1,143
Spaniards.....	2,903		
Other Europeans.....	977	Total.....	223,542

^a Unless otherwise stated these statistics are for the fiscal year ended June 30, 1907.*Births reported in Manila.^a*

Nationality.	Male.	Female.	Total.	Annual average per 1,000.
Americans.....	71	56	127	24.42
Filipinos.....	3,598	3,337	6,935	35.51
Spaniards.....	16	16	32	11.02
Other Europeans.....	11	11	22	22.51
Chinese.....	11	8	19	1.05
All others.....	1		1	0.87
Total and average.....	3,708	3,428	7,136	31.92

^a Incomplete.*Number of deaths and death rate per 1,000 among residents of Manila, by nationalities.*

Nationality.	Number of deaths.	Annual average per 1,000.	Nationality.	Number of deaths.	Annual average per 1,000.
Americans.....	20	5.59	Chinese.....	329	18.24
Filipinos.....	7,804	39.96	All others.....	22	19.24
Spaniards.....	46	15.84			
Other Europeans.....	21	21.49	Total and average.....	8,251	36.91

A classified report of all deaths occurring in Manila, including transients.

Males.	Number.	Females.	Number.
Married.....	955	Married.....	806
Divorced.....	1	Divorced.....	2
Widowers.....	312	Widows.....	546
Single.....	885	Single.....	240
Boys.....	2,585	Girls.....	2,110
Condition not stated.....	96	Condition not stated.....	33
Total.....	4,834		3,737
Grand total.....			8,571

Stillbirths.....	310
Number of deaths with medical attendance.....	4,805
Number of deaths without medical attendance.....	3,706
Total.....	8,571

Deaths, by age, including transients.

Age.	Number.	Age.	Number.
Under 30 days.....	391	40 years to 50 years.....	530
30 days to 1 year.....	2,167	50 years to 60 years.....	397
1 year to 2 years.....	677	60 years to 70 years.....	294
2 years to 5 years.....	745	70 years to 80 years.....	217
5 years to 10 years.....	212	80 years to 90 years.....	122
10 years to 15 years.....	102	90 years to 100 years.....	49
15 years to 20 years.....	344	Over 100 years.....	38
20 years to 25 years.....	442	Unknown.....	19
25 years to 30 years.....	536		
30 years to 40 years.....	791	Total.....	8,571

Comparative mortality in Manila from January 1, 1901, to June 30, 1907.

Months.	1901.		1902.		1903.		1904.	
	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.
January.....	753	a 36.25	760	a 36.58	602	a 28.98	796	b 42.64
February.....	689	a 36.72	706	a 37.63	511	a 27.23	709	b 40.59
March.....	855	a 42.66	770	a 37.06	539	a 25.94	751	b 40.22
April.....	286	a 44.07	1,327	a 66.01	549	a 27.31	748	b 41.40
May.....	903	a 43.47	1,688	a 81.26	770	a 37.08	766	b 41.03
June.....	621	a 30.89	1,418	a 70.54	592	a 29.45	800	b 44.23
July.....	608	a 29.27	2,223	a 107.02	620	b 33.21	866	b 46.39
August.....	702	a 33.79	1,712	a 82.42	862	b 46.17	1,032	b 55.23
September.....	767	a 38.15	1,132	a 56.31	1,228	b 67.97	1,064	b 58.89
October.....	856	a 41.16	927	a 44.02	1,217	b 65.19	1,018	b 54.53
November.....	848	a 42.18	1,035	a 51.43	974	b 63.91	957	b 52.97
December.....	858	a 41.30	753	a 36.25	894	b 47.89	794	b 42.53

Months.	1905.		1906.		1907. /	
	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.
January.....	685	b 36.69	737	b 39.47	632	c 33.31
February.....	698	b 36.06	595	b 35.28	473	c 27.59
March.....	563	b 30.15	600	b 32.13	494	c 24.45
April.....	530	b 29.32	555	b 30.27	416	c 22.65
May.....	526	b 28.16	600	b 32.13	462	c 24.35
June.....	593	b 32.81	693	b 36.72	402	c 21.89
July.....	747	b 40.00	1,451	b 77.72		
August.....	841	b 45.03	1,182	b 63.31		
September.....	1,013	b 56.06	835	b 46.22		
October.....	850	b 45.51	684	b 36.64		
November.....	944	b 52.24	653	b 36.14		
December.....	841	b 45.03	597	b 31.98		

a Death rate computed on population of 244,732 (health department's census).

b Death rate computed on population of 240,941 (official census, 1903.)

c Death rate computed on population of 223,542 (health census of 1907).

Mortality compared with same period of previous years.

	First quarter.		Second quarter.		Third quarter.		Fourth quarter.	
	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.
1901.....	2,327	42.93	2,410	43.97	2,077	47.49	2,561	46.22
1902.....	2,226	41.25	4,433	80.89	5,067	91.46	2,715	29.00
1903.....	1,652	30.48	1,911	34.87	2,710	48.91	3,085	55.68
1904.....	2,256	41.16	2,314	42.22	2,962	53.46	2,789	49.98
1905.....	1,856	34.24	1,649	30.09	2,601	46.94	2,635	47.56
1906.....	1,932	35.64	1,848	33.72	3,468	62.59	1,934	34.90
1907.....	1,569	28.48	1,280	22.98				



A VIEW OF THE SITE OF DAM OF THE NEW WATER SYSTEM LOOKING WEST THROUGH THE GORGE.



LAYING PIPE FOR THE NEW WATER SYSTEM.



ANOTHER VIEW OF THE SITE OF DAM OF THE NEW WATER SYSTEM LOOKING WEST THROUGH THE GORGE.



LAYING PIPE FOR THE NEW WATER SYSTEM.

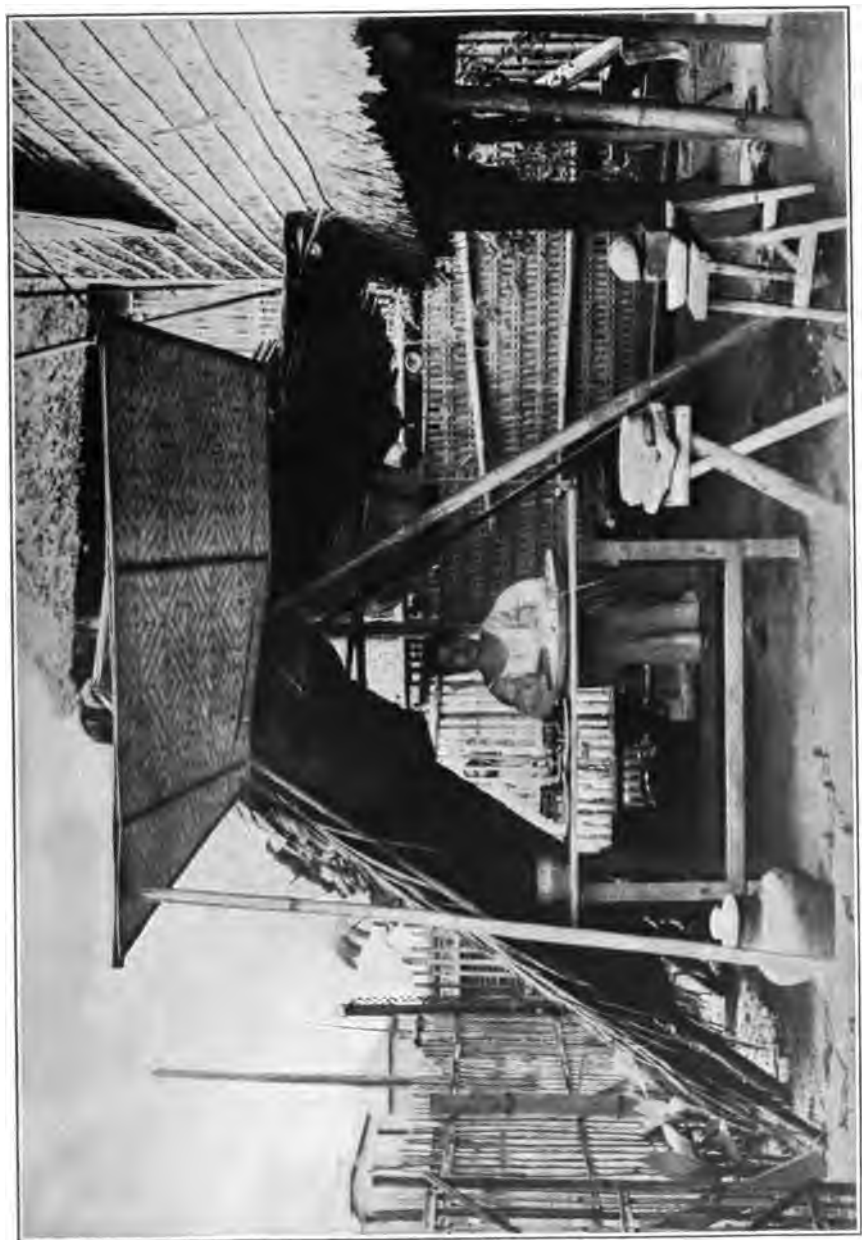




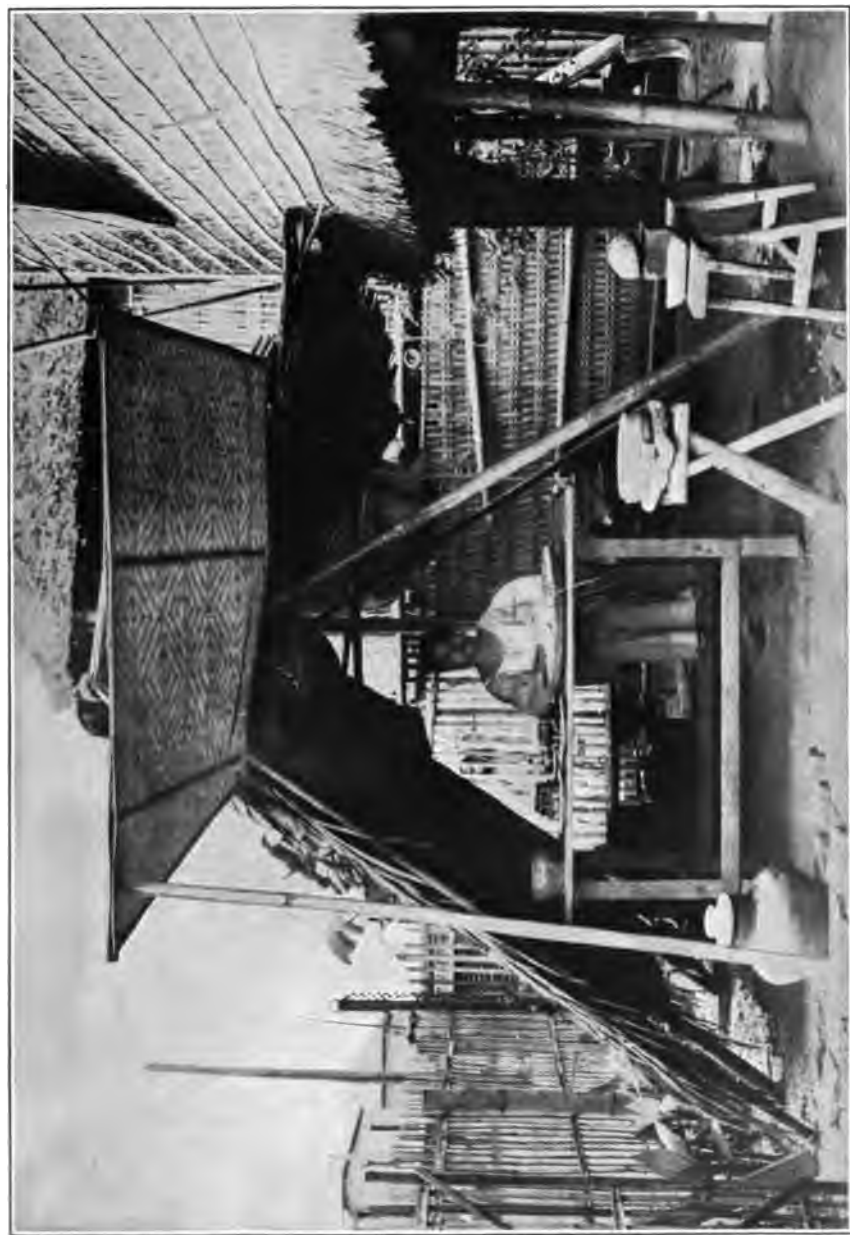
A VIEW OF THE NEW RESERVOIR OF THE WATER SYSTEM UNDER CONSTRUCTION.



NATIVE PEDDLERS OF SORBETE AND DULCES.



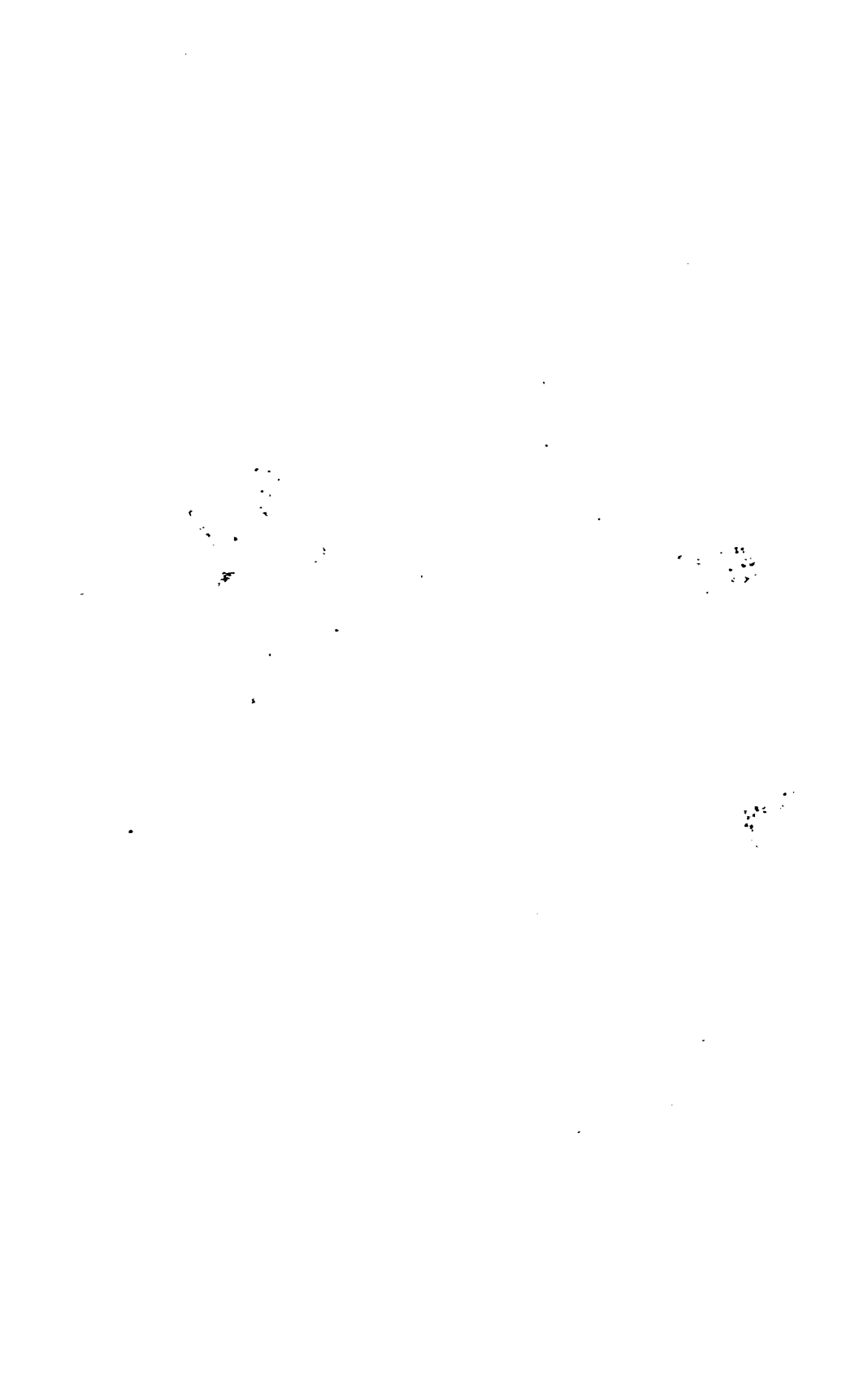
TIENDA BEFORE SANITARY REPAIRS.



TIENDA BEFORE SANITARY REPAIRS.



MAKING MISUA AND MIQUI (NATIVE FOODS).





MILK VENDORS, OLD STYLE.



MILK VENDOR, NEW STYLE.



MILK STERILIZING DEPOT CONDUCTED BY THE "GOTA DE LECHE" SOCIETY.



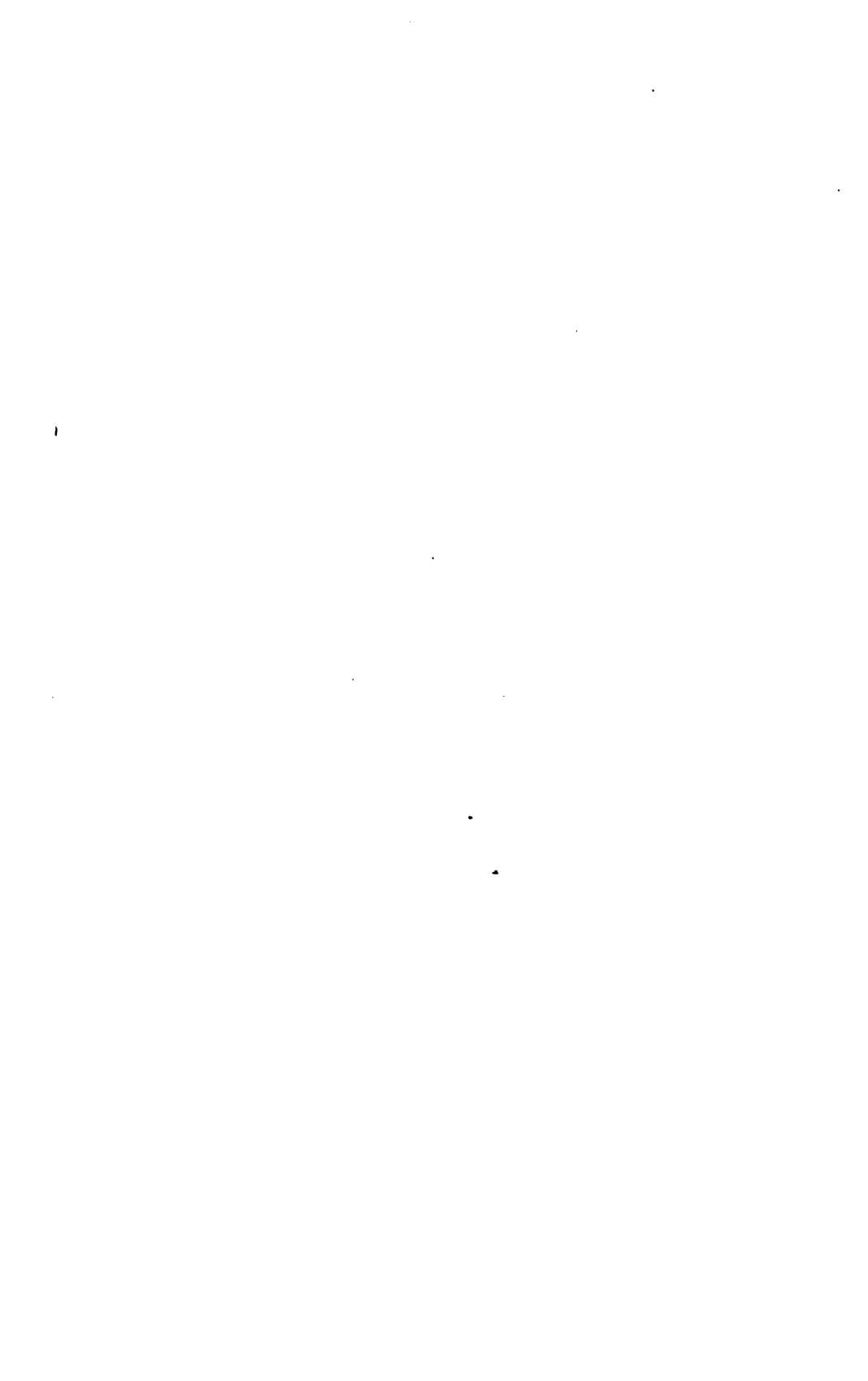
MILITARY WATER WAGON DELIVERING DISTILLED WATER.

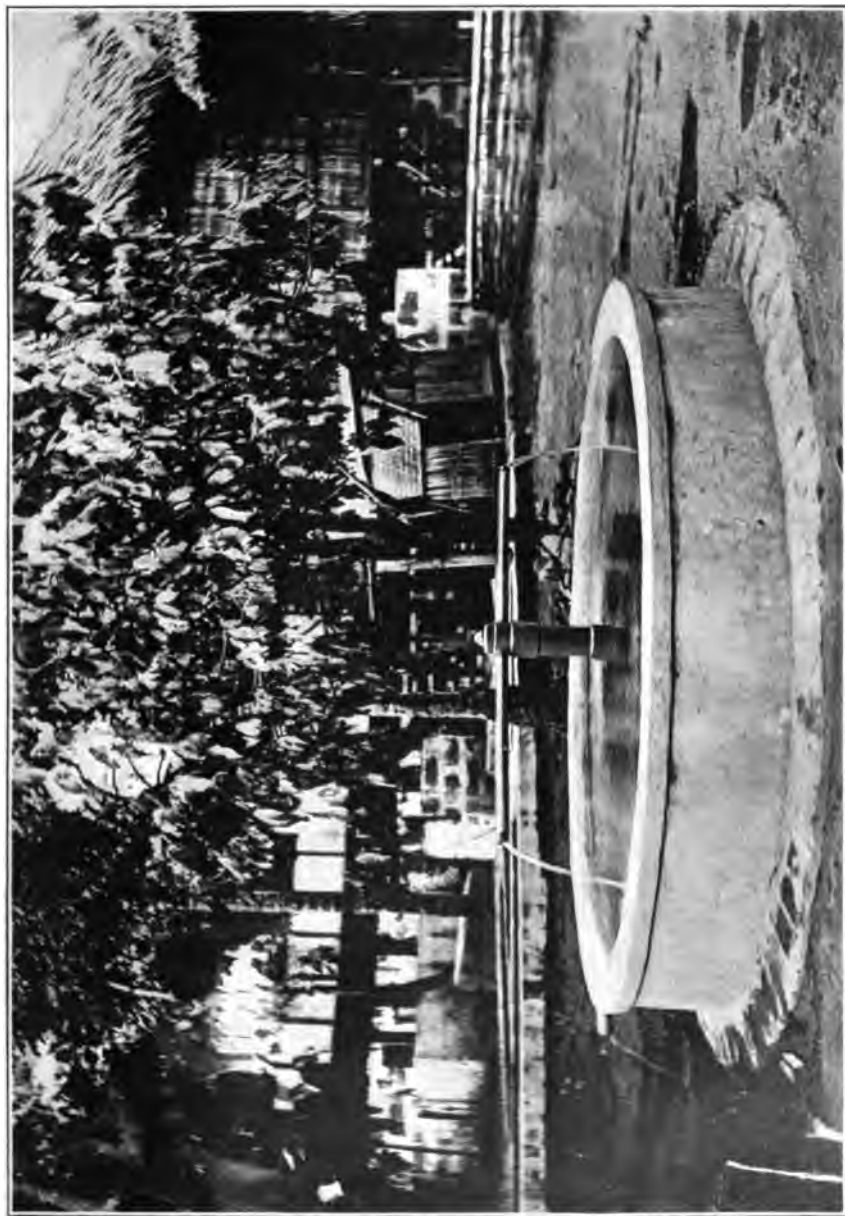


DISTILLED WATER WAGON, BUREAU OF SUPPLY, DIVISION OF COLD STORAGE.

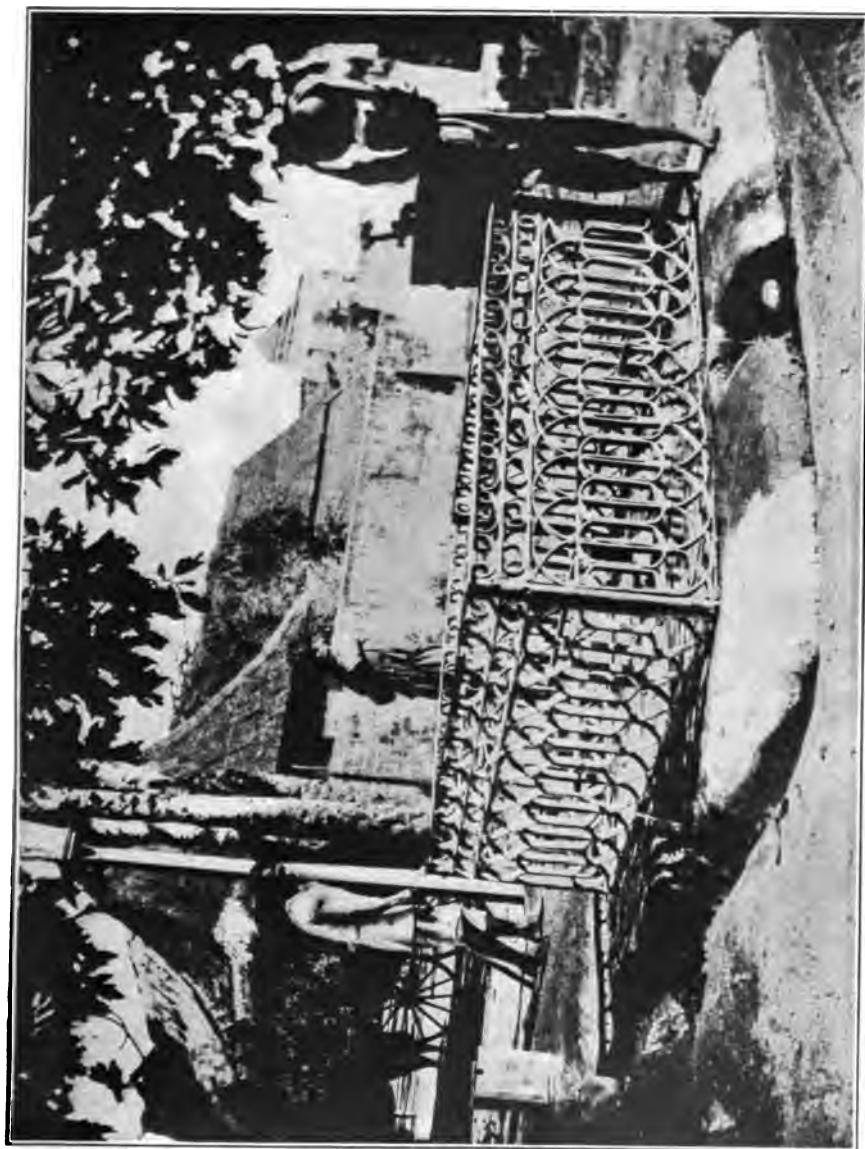


GOVERNMENT COLD-STORAGE ICE WAGON.





PRIVATE ARTESIAN WELL, BACOLOR, PAMPANGA PROVINCE.



MUNICIPAL ARTESIAN WELL, BACOLOR, PAMPANGA PROVINCE.





WARD SCENE, CHINESE HOSPITAL

Reports received of blind persons living in the various provinces.

Provinces.	Race.	Males.	Females.	Children.		Single.		Married.		Widowers.	Widows.	Total.
				Males.	Females.	Males.	Females.	Males.	Females.			
Abra.....	Filipino.	44	55	2	...	10	15	18	22	14	18	99
Albay.....	do.	365	301	73	67	177	150	84	47	31	37	666
Ambos Camarines.....	do.	136	116	8	16	64	46	42	19	22	35	252
Antique.....	do.	72	59	4	4	28	23	20	10	15	22	131
Bataan.....	do.	22	21	7	5	8	8	4	1	3	7	43
Batangas.....	do.	92	88	15	7	32	38	32	10	13	33	180
Bohol.....	do.	198	150	46	25	91	69	46	25	15	31	348
Bulacan.....	do.	122	82	14	6	44	35	37	17	27	24	204
Cagayan.....	do.	51	64	3	4	15	14	18	13	15	33	115
Capiz.....	do.	148	148	12	9	54	49	46	27	36	63	286
Cavite.....	do.	52	44	5	4	23	20	15	6	10	14	96
Cebu.....	do.	344	285	40	22	152	133	106	59	46	81	639
Ilocos Norte.....	do.	90	107	5	1	21	36	37	18	27	52	197
Ilocos Sur.....	do.	114	132	13	15	38	37	40	29	23	51	246
Iloilo.....	do.	229	235	28	14	92	89	69	31	40	101	464
La Laguna.....	do.	127	107	17	9	40	39	50	23	20	36	234
Leyte.....	do.	326	196	64	22	168	95	57	29	37	49	521
Masbate.....	do.	32	35	2	2	14	13	12	7	4	13	67
Misamis.....	do.	71	48	6	4	43	21	14	12	8	11	119
Negros Occidental.....	do.	59	40	...	2	31	16	21	5	7	17	99
Negros Oriental.....	do.	142	103	14	15	57	34	36	15	35	39	245
Nueva Ecija.....	do.	43	42	3	3	16	13	12	9	12	17	85
Pangasinan.....	do.	166	183	12	15	63	47	64	43	27	78	249
Rizal.....	do.	115	86	30	9	30	26	34	11	21	40	201
Romblon.....	do.	36	29	5	6	17	17	10	4	4	2	65
Samar.....	do.	133	69	...	...	67	29	32	20	34	20	202
Sorsogon.....	do.	225	140	25	16	139	94	45	17	16	13	365
Surigao.....	do.	37	26	6	2	14	6	12	12	5	6	63
Tarlac.....	do.	47	36	1	1	17	10	22	8	7	17	83
Tayabas.....	do.	101	84	...	...	...	...	...	...	...	...	185
Union.....	do.	59	46	3	2	19	9	21	14	16	21	105
Total.....		3,798	3,166	468	307	1,583	1,231	1,066	563	590	981	6,964

Smallpox and plague reports for Manila.

Nationality.	Smallpox.				Plague.			
	Cases.		Deaths.		Cases.		Deaths.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Americans.....		1						
Filipinos.....	49	24	1					
Foreigners.....								
Chinese.....	1							
Total.....	50	25	1					

Health district and age.	Smallpox.		Plague.	
	Cases.	Deaths.	Cases.	Deaths.
Health districts:				
No. 1, Intramuros.....	7			
No. 2, Meisic.....	40	1		
No. 4, Sampaloc.....	8			
No. 5, Tondo.....	19			
No. 6, Paco.....	1			
Total.....	75	1		
Agas:				
Under 1 year.....	5	1		
1 year to 10 years.....	21			
10 years to 20 years.....	23			
20 years to 30 years.....	20			
30 years to 40 years.....	5			
40 years to 50 years.....	1			
Over 50 years.....	1			
Total.....	75	1		

Number of cases found alive, smallpox, 75; plague, 0.
 Number of cases found dead, smallpox, 1; plague, 0.

Cholera report, city of Manila.

Nationality.	Cases.		Deaths.	
	Male.	Female.	Male.	Female.
Americans.....	12	.....	9	.....
Filipinos.....	371	291	318	270
Foreigners.....	17	5	6	2
Chinese.....	22	.....	20	.....
Total.....	422	296	353	272

District and age.	Cases.	Deaths.
Health districts:		
No. 1, Intramuros.....	87	60
No. 2, Meisic.....	241	208
No. 4, Sampaloc.....	102	80
No. 5, Tondo.....	220	196
No. 6, Paco.....	68	63
Total.....	718	625
Ages:		
Under 1 year.....	9	9
1 year to 10 years.....	178	168
10 years to 20 years.....	123	93
20 years to 30 years.....	183	165
30 years to 40 years.....	112	91
40 years to 50 years.....	52	51
Over 50 years.....	51	48
Total.....	718	625

Number of cases found alive.....	282
Number of cases found dead.....	436
Total.....	718

Cases and death registered from cholera in the Philippine Islands (city of Manila excepted).

Province.	Cases.	Deaths.	Mortality.
			<i>Per cent.</i>
Bataan.....	1	0	0.00
Batangas.....	2	1	50.00
Benguet.....	1	1	100.00
Bulacan.....	1,290	925	71.70
Capiz.....	260	156	60.00
Cavite.....	214	165	77.10
Iloilo.....	1,798	1,319	73.45
Laguna.....	447	344	76.95
Moro.....	9	7	77.77
Nueva Ecija.....	765	546	71.37
Occidental Negros.....	92	64	69.56
Pampanga.....	1,038	764	73.60
Pangasinan.....	85	65	76.44
Rizal.....	780	627	80.38
Samar.....	80	69	86.25
Tarlac.....	91	78	85.71
Tayabas.....	132	112	84.84
Grand total and general average.....	7,085	5,243	74.00

Epidemic of cholera in the city of Manila and provinces from August 23, 1905, to June 30, 1907.

Period.	Manila.			Provinces.		
	Cases.	Deaths.	Mortality.	Cases.	Deaths.	Mortality.
			<i>Per cent.</i>			<i>Per cent.</i>
August, 1905.....	51	46	90.19	81	65	80.24
September, 1905.....	147	126	85.71	334	252	75.44
October, 1905.....	31	29	93.54	358	249	69.55
November, 1905.....	18	17	94.44	490	335	68.79
December, 1905.....	8	8	100.00	387	290	75.06
First quarter, 1906.....	28	27	96.42	2,138	1,644	76.89
Second quarter, 1906.....	102	92	90.19	365	236	64.65
Third quarter, 1906.....	684	565	86.98	4,893	3,703	75.67
Fourth quarter, 1906.....	34	30	88.20	1,942	1,379	71.00
First quarter, 1907.....				235	148	62.97
Second quarter, 1907.....						
Total.....	1,103	970	87.94	11,213	8,301	74.03

Culion leper colony division.

Status.	Europeans.		Filipinos.		Chinese.		Total.
	Male.	Female.	Male.	Female.	Male.	Female.	
Remaining, September 30, 1906.....	1		199	137	1		338
Admitted.....			434	181			615
Born.....			2	3			5
Discharged.....			4	1			5
Transferred.....							
Escaped.....			7	2			9
Died.....			135	70			205
Remaining, June 30, 1907.....	1		499	248	1		739

FINANCIAL STATEMENT.

The following statement shows the expenditures made during the fiscal year 1907 chargeable against the appropriation made by act No. 1527 for the bureau of health during that period:

Amount appropriated..... ₱1,038,000.00

Expenditures chargeable as follows:

Salaries and wages—

General.....	₱133,438.26
Examining boards.....	1,125.88
Emergency funds, general.....	1,843.75
District health officers, at large.....	37,015.62
District health officers, special districts.....	76,299.10
Culion leper colony division.....	16,680.88
Emergency fund, Culion.....	340.35
Vaccinating division.....	54,275.50
San Lazaro Hospitals division.....	37,007.50
Emergency fund, San Lazaro.....	17,245.55
Civil Hospital division.....	65,167.87
Emergency fund, Civil Hospital division.....	176.00
Benguet Sanitarium division.....	7,741.17
Prison Sanitation division.....	6,943.33

455,300.76

Contingent expenses:

General—

Medicines for indigent natives.....	5,794.60
Disinfecting apparatus and disinfectants.....	4,953.85
Stationery and office supplies.....	2,520.16
Miscellaneous supplies.....	509.41
Rent, post-office box.....	32.00
Transportation of freight.....	1,494.97

Contingent expenses—Continued:

General—Continued.

Telephone, general.....	₱700.73
Purchase of office furniture.....	1,909.66
Cablegrams.....	66.00
Periodicals.....	54.60
Repairs to office furniture.....	182.25
Surgical instruments.....	18.00
Printing.....	15,181.39
Transportation, city of Manila.....	20,133.89
Traveling expenses, regular employees.....	10,745.25
Incidentals.....	190.40
Postage and telegrams.....	1,450.88
Hospicio de San José.....	46,785.30
Hospital de Santiago.....	960.00
Colegio de Santa Isabel.....	4,848.56
San Vicente de Paul Orphan Asylum.....	1,448.90
Traveling expenses, district health officers, special districts.....	9,137.45
Sanitary stations, rent.....	320.00
Incidentals, sanitary station.....	131.65

₱129,569.90

Vaccinating division:

Ice for preserving virus.....	442.95
Purchase of vaccine.....	30,236.75
Antiseptic supplies and dressings for vaccinators.....	2,710.12
Traveling expenses of vaccinators.....	9,319.69

42,709.51

San Lazaro hospitals division:

Subsistence.....	48,884.57
Leper gratuity.....	2,316.43
Medicines.....	1,886.41
Fuel.....	1,769.93
Lights.....	3,002.20
Soap.....	673.51
Forage and horseshoeing.....	706.49
Clothing, insane.....	619.80
Tobacco and cigarettes.....	124.61
Clothing lepers.....	1,715.12
Bedding.....	195.80
Incidentals.....	1,890.42
Telephone.....	176.05

63,961.34

Civil hospital division:

Subsistence.....	61,963.54
Medicines.....	8,850.83
Miscellaneous and general supplies.....	5,528.71
Post-office box rent.....	24.00
Transportation in Manila.....	3.00
Repairs and purchase of equipment.....	1,019.02
Rent of buildings.....	12,000.00
Lights.....	4,187.63
Telephone.....	281.00
Coal and oil.....	1,284.88
Laundry.....	7,367.23
Forage.....	390.53
Horseshoeing.....	38.64
Traveling expenses, employees.....	920.00
Incidentals.....	286.55

104,145.06

Culion leper colony division:

Subsistence, employees.....	2,959.40
Subsistence, lepers.....	27,835.56
Hospital equipment.....	337.20
Leper gratuity.....	4,734.28
Clothing.....	3,189.40
Bedding.....	200.00
Stationery and printing supplies.....	18.20

Culion leper colony division—Continued.

Fuel, light, oil, etc.....	₱1,067.53
Medicines and medical supplies.....	206.05
Incidentals.....	2,153.10
Transportation of lepers.....	780.90

₱43,481.60

Prison sanitation division:

Medicines.....	9,135.73
Disinfectants.....	1,924.06

11,059.79

Benguet Sanitarium division:

Subsistence.....	2,914.51
Hospital furnishings.....	894.66
Medicines and surgical supplies.....	267.04
Fuel.....	348.20
Maintenance of transportation.....	44.45
Laundry.....	450.00
Repairs.....	3.00
Incidentals.....	262.95

5,184.81

Grand total..... 855,412.77

In addition to the foregoing statement of actual expenditures made from funds appropriated in act No. 1527, there are the following outstanding obligations chargeable to the appropriation of the bureau and funds appropriated for same during the fiscal year 1907:

Stationery and office supplies.....	₱188.66
Incidentals, sanitary stations.....	19.80
Medicines and supplies, Central Dispensary.....	493.78
Dressings, supplies, vaccinating division.....	663.50
Disinfectants, Manila.....	274.32
Medicines and disinfectants, prison sanitation division.....	277.54
Medicines and supplies, indigent persons.....	308.40
Incidentals, San Lazaro Hospital.....	108.93
Medicines and supplies, San Lazaro Hospital.....	930.39
Soap, San Lazaro Hospital.....	480.70
Miscellaneous supplies, civil hospital.....	577.15
Medicines and supplies, civil hospital.....	1,587.10
Coal and oil, civil hospital.....	202.81
Medicines and supplies, Culion leper colony.....	620.89
Bedding, Culion leper colony.....	174.66
Freight and postage, Culion.....	100.41
Clothing, Culion leper colony.....	3,172.43
Incidentals, Culion leper colony.....	50.96
Kitchen equipment, Culion leper colony.....	28.50
Medical and surgical supplies, Benguet Sanitarium.....	35.02
Freight, Benguet.....	8.63
Balance freight, Benguet.....	1.89

10,306.47

In addition to these appropriations there was appropriated by resolution of the Commission, subsequently confirmed by act No. 1660, ₱10,000 for the collection of lepers, the whole of which has been expended as follows:

Collection and maintenance of lepers.....	₱8,070.53
Traveling expenses of officers and employees in connection with the collection of lepers.....	420.70
Outstanding obligations.....	8,491.23
	1,508.77

10,000.00

The Commission also appropriated ₱55,000 for the construction of an annex for 250 additional insane at San Lazaro, the construction of which was undertaken by the bureau of public works. From this sum ₱10,000 was allotted for the furnishing and equipment of the annex, which was expended as follows:

Phonograph and records.....	₱125. 00
Sundries.....	4, 770. 38
Outstanding obligations:	
Miscellaneous sup., bureau of science—	
Coal, blankets, etc.....	1, 031. 90
Others not specified.....	2, 072. 72
Returned to bureau of public works.....	2, 000. 00
	<hr/>
	10, 000. 00

The following amounts as credits to this appropriation were collected during the year:

Refund by provinces of salaries of district health officers.....	₱66. 363. 02
Refund by bureau of education of one-half salary of Dr. Anna Dixon Peck, supervising nurse.....	472. 21
Sale of medicines.....	730. 86
Sale of supplies, ambulances, bull carts, sanitary pails, demijohns, etc..	4, 712. 68
Miscellaneous collections, San Lazaro Hospital.....	308. 20
Miscellaneous collections, civil hospital.....	26, 176. 12
Miscellaneous collections, Benguet sanitarium.....	10, 173. 13
Subsistence Culion leper colony.....	154. 64
	<hr/>
	109, 087. 68

NOTE.—Detailed statistical data on the following subjects has been omitted from this appendix and are on file in the Bureau of Insular Affairs, War Department:

Births and deaths.
Diseases causing death.
Deaths by occupations.
Number attended by municipal physicians.
Report of crematories.
Sanitary inspection and disinfection.
Action taken on application for licenses.
Vaccinations.
Sera.
Cholera.
San Lazaro Hospital.
Leprosy, cholera, plague, and smallpox statistics.
Morgue and crematory.
Bilibid vital statistics.
Civil hospital.
Chinese hospital.
Benguet sanitarium.
Iwahig penal colony.
Sanitary engineering data.

APPENDIX B.

REPORT OF THE CHIEF QUARANTINE OFFICER.

UNITED STATES TREASURY DEPARTMENT,
PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
OFFICE OF THE CHIEF QUARANTINE OFFICER FOR THE PHILIPPINE ISLANDS,
Manila, P. I., August 1, 1907.

SIR: I have the honor to submit the following report of the transactions of the bureau of quarantine service for the Philippine Islands for the fiscal year ended June 30, 1907:

The close of this period finds the health situation in the Philippines more satisfactory than at any time since American occupation of these islands in 1898, and from a study of the history previous to that date it is probably safe to infer that sanitary conditions are better than for many years prior to 1898.

Cholera is not known to be present anywhere in the islands. There has been no case of plague since April, 1906. There is less smallpox than for any period during the past 50 years. In provinces in which there have been 6,000 deaths annually heretofore from this cause not one person has died, nor has there been one death from this disease in the city of Manila. Owing to the thorough and persistent vaccination of the crews of vessels only one case of varioloid occurred among them, instead of a great number as heretofore.

While the major part of the improvement which has been brought about is due to the efforts of the insular health authorities, yet great assistance to this end was rendered by the quarantine service in the Philippines, and by the Public Health and Marine-Hospital Service officers who are stationed at the principal China and Japan ports. Not only was not a single case of quarantinable disease permitted to enter the Philippine Islands from foreign countries, but also the efforts of this bureau in preventing the spread by sea of cholera, which prevailed extensively in Manila at the beginning of the fiscal year, were entirely successful.

It is satisfactory to report that the work of the Public Health and Marine-Hospital Service continues to meet with encouragement at the ports of entry of the Philippine Islands, and the most cordial relations exist between the Service and the army, navy, customs, and insular officials. The uniform effectiveness of the measures instituted for the protection of the islands has gained for the Service the confidence of the public, and even the inconvenience of 14 months of outgoing quarantine during a period of great business depression was borne with admirable patience.

PERSONNEL.

Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippine Islands.

Manila.—Passed Asst. Surg. Victor G. Heiser, in command; Passed Asst. Surg. T. B. McClintic; Asst. Surg. F. H. McKeon; pharmacist and disbursing officer, N. C. Comfort.

Mariveles.—Asst. Surg. R. E. Ebersole.

Iloilo.—Asst. Surg. Joseph Pettyjohn.

Cebu.—Asst. Surg. Herbert M. Manning; Pharmacist Charles R. McBride.

Zamboanga.—Acting Asst. Surg. J. F. Siler.

Jolo.—Acting Asst. Surg. Charles B. Ewing.

Cavite.—Acting Asst. Surg. D. N. Carpenter.

Olongapo.—Acting Asst. Surg. C. P. Kindleberger.

In addition to the officers 71 employees are now engaged in assisting to conduct the service operations. They perform the duties of clerks, disinfectors, vaccinators, crews of vessels, quarantine attendants, etc. Total personnel, 83.

The present chief quarantine officer also occupied the position of director of health for the Philippine Islands during the year. The arduous labors of both positions, the responsibility, and the control of an appropriation of over a million has taxed his physical powers almost to the utmost.

release and sixteen days after isolation and disinfection a suspicious eruption appeared. The cases all occurred among persons whose destination was a military post. The majority of the army surgeons who saw these eruptions diagnosed them as chicken pox, while others thought it was varioloid. All the cases were vaccinated with a potent lymph sixteen days or more previously.

On the United States cruiser *Chattanooga* several cases occurred before her arrival at quarantine. At Cebu, the British steamer *Mazagon* had one case of smallpox occur on board and was treated as outlined above.

The vaccination of the crews of vessels engaged in the interisland trade has been continued. At Manila there were 4,099 vaccinations, a decrease of 562 from the year previous. There were 506 vaccinations at Iloilo and 180 at Cebu—a total of 4,785 for the service in the Philippine Islands. The small number at Cebu and Iloilo is due to the fact that the islands in that vicinity have been completely vaccinated, and consequently there remain practically no more adults who require vaccination at this time.

Among the crews vaccinated at Manila there were 3,415 first, 727 second, and 150 third vaccinations, a total of 4,292, with 1,914 known "takes." The percentage of "takes," as in former years, was over 50 per cent, but the percentage is gradually decreasing, owing to the progress of the plan now being carried out by the bureau of health to vaccinate the entire population of the islands.

The practice of requiring crews to have service vaccination cards before they are employed on interisland vessels has been continued, and applicants for positions on vessels are vaccinated at all hours of the day at the offices of the service in the islands. To this practice may be attributed the absence of smallpox on vessels, especially among the crew. None of the smallpox cases detected during the year were members of the crew.

The card system, adopted four years ago, has proved very satisfactory. Red cards are given when a person is vaccinated for the first time, and if a "take" is found on inspection, a blue card is issued, which exempts the holder from revaccination. If the first vaccination does not "take," the person is revaccinated and given a white card, and if the second vaccination does not "take," he is vaccinated a third time, and a fourth if no "take," and then given a blue card, with an indicator that four vaccinations have proved unsuccessful. Such persons are revaccinated about every six months until a "take" is obtained, when a blue "successfully vaccinated" card is issued.

No better proof as to the efficacy of vaccination exists than in the Philippine Islands. Provinces which from time immemorial have had from 2,000 to 6,000 deaths from smallpox every year have not had a single death from this cause since their vaccination was completed more than a year ago.

LEPROSY.

No cases of leprosy were detected at the quarantine inspection of incoming ships. The vessels used by the bureau of health in transporting lepers to the Culion leper colony were thoroughly disinfected on three different occasions at the Mariveles quarantine station. It is believed that the systematic inspection which is made of vessels that arrive at ports of entry to a large extent deters lepers in the Philippines from traveling from island to island, and in this way the efforts of the bureau of health in eradicating this disease are greatly aided.

VESSELS BOARDED.

There were 6,444 incoming vessels inspected upon arrival at the ports of entry of the Philippine Islands. At Manila, 3,193 vessels were boarded; at Iloilo, 1,198; at Cebu, 1,855; and at the other ports of entry, 198. This is a decrease from last year's figures of 73 vessels at Manila, and a decrease of 1 vessel at the other ports of entry—a total decrease of 74 vessels. Last year the total number boarded was 6,518. This does not mean that less vessels arrived at ports of entry, but that more vessels were exempted from inspection. At Jolo and Zamboanga only vessels arriving directly from foreign ports are inspected. At Iloilo, vessels arriving from near-by Panay and Negros ports are allowed to come in and go out of port without any restrictions. At Cebu, vessels from the island of Cebu are treated as ferryboats, and do not await quarantine inspection or carry bills of health. At Manila, army transports carrying surgeons and vessels arriving from Subic and Olongapo are not subject to quarantine inspection.

Vessels at all ports controlled by the service are boarded from sunrise to sunset, and later in the evening when the occasion demands and such procedure is deemed safe. Vessels coming to Manila can secure pratique at Mariveles up to sunset, thus making the boarding hours at Manila in effect from sunrise to 9 p. m. It is hoped that the health conditions in the islands will remain as favorable as they are at present, and that the inspection upon arrival of interisland vessels can be discontinued. Their sanitary condition in that event would be supervised by frequent inspections while at their berths, and the inspection of some vessels on arrival would be continued until such time as they are maintained clean and sanitary.

VESSELS DISINFECTED.

There were disinfected at Manila 79 vessels, at Iloilo 2 and at Cebu 4.

Four vessels were disinfected on account of cholera, 6 on account of smallpox, 3 on account of being employed in transporting lepers to the Cullion leper colony; 1 for scarlet fever, 1 on account of cerebro-spinal meningitis, and the remainder because they came from infected ports, from drydocks at Hongkong or Singapore, or were proceeding to United States ports.

The disinfection of infected vessels and the treatment of crews and passengers met with the same success as heretofore. Not one secondary case of any quarantinable disease occurred among the personnel detained.

Three Navy vessels were disinfected at the request of the admiral commanding the Asiatic Fleet—the *Chattanooga*, on account of repeated cases of smallpox occurring on board, and the first-class cruiser *Maryland*, throughout, on account of cerebro-spinal meningitis which prevailed on the ship. No further cases occurred after the disinfection. The U. S. S. *General Alava* was disinfected on account of smallpox.

Vessels bound for the United States and carrying steerage passengers have been partially disinfected, the crews and steerage passengers bathed, and their effects disinfected.

The regular army transports leaving Manila for the United States were all partially disinfected. Vessels from the China coast, where no officer of the service is stationed, are required to call at Mariveles for such disinfection as seems to be indicated.

There has been a decrease in the number of vessels infected with quarantinable diseases as compared with former years. For the fiscal year 1905 there were 28; for 1906, 23; for 1907, 14.

The extensive vaccination operations of the bureau of health and the service rules with regard to crews being vaccinated has reduced to a minimum the liability of smallpox occurring on vessels, and consequently was an important factor in lessening the number of infected vessels.

FUMIGATION OF VESSELS.

The large number of vessels from plague-infected ports which call here and often are en route to the United States and foreign countries, and which are either partially or completely laden with cargo consisting of tea and other freight which might be damaged by sulphur or other gases recommended by the quarantine regulations for the destruction of vermin, has brought to the attention of this office in a forcible manner the desirability of seeking for another gas which will destroy vermin without endangering cargo, and at the same time be cheaply and easily generated without endangering the lives of the crew or others while the process is being carried out. This problem is constantly becoming more important, as far as Manila is concerned, because wharves at which deep seagoing vessels can go alongside are now actually under construction, so that before another year has passed the opportunity for rats and vermin finding their way ashore will be vastly increased. Often vessels arrive here which it would be most desirable to fumigate, but the nature of their cargo is such that fumigation with sulphur would be attended with considerable risk, and the amount of the cargo is such that the cost of unloading it would be prohibitive. If a safe gas which would destroy vermin could be used with the cargo remaining in the hold, undisturbed, it is believed that a long step in advance would be made in preventing a disease like plague gaining admission to a country. It is understood that at Marseille and at German ports carbon monoxide and carbon dioxide have been used with considerable success. The Public Health and Marine-Hospital Service at Washing-

ton has been requested to investigate this matter, and it is hoped that the result of the work will soon be available.

The plan of fumigating all vessels engaged in the interisland traffic once every six months has been continued. Owing to this constant fumigation the number of rats on interisland vessels has been so reduced that it is very seldom that more than a dozen are found even on large vessels after the fumigation, and for this reason the period between fumigations has been gradually lengthened, once a year in many cases being ample. The latter policy was pursued until the reappearance of plague along the nearby China coast, and accounts for the smaller number of fumigations for the year. Since plague has been so close a constant vigilance has been exercised to keep the vessels plying between Philippine ports as free as possible from rats and vermin. There were 161 vessels fumigated during the year—116 at Manila, 14 at Iloilo, and 31 at Cebu. Vessels from plague-infected ports are fumigated on arrival at Philippine ports. Ships from plague centers coming to Philippine Island ports and bound for the United States are fumigated here to kill the vermin on board before taking cargo. Vessels on the Hongkong-Manila run are now fumigated at Hongkong instead of at Manila. The work of fumigation has been conducted without friction or complaint during the year, and has the support of the shipping interests, and also the traveling public.

CARGO.

The same requirements and regulations which have been in force during the past two years with regard to imported cargo were continued in force. Vegetables which for commercial reasons must be thoroughly dry before they are shipped—such as potatoes, onions, garlic, etc.—are permitted to be landed when they are certified as having been grown in noninfected districts. Vegetables which are eaten raw—such as cabbage, celery, lettuce, etc.—are not allowed to be shipped to Philippine Island ports unless from the United States. These regulations encounter very little opposition, because the prohibition against their entrance during the past few years so stimulated the home industry that sufficient of this class of vegetables is now grown in the islands, and there is no longer a large demand for the foreign products, the fresher home-grown article being preferred.

The master of every vessel arriving from a foreign port signs a statement added to the quarantine declaration that he will land no ship's stores without a permit from the quarantine office. This procedure was necessary on account of all kinds of articles and produce liable to convey infection being forwarded in care of a member of the crew as "ship's stores," and then landed at Philippine Island ports on the first favorable opportunity. This procedure has made considerable additional work, but has accomplished a vast amount of good by absolutely controlling everything landed in the islands. The customs authorities assist the service in the enforcement of this regulation, and the plan has worked very successfully.

The shipment of various cargoes between interisland ports has also received considerable attention. For economical purposes the service supervises the shipment of hides, lard, fresh-fish products, and similar commodities from Manila to the provinces, and from the provinces to Manila. Thousands of permits for such cargo were issued during the year, and numerous visits to factories and fish-packing places have been made to enforce proper sterilization of animal foodstuffs and to identify particular shipments.

OUTGOING QUARANTINE.

The constantly increasing commerce and travel between the Philippine Islands and the United States naturally increases the work of supervising the shipment of cargo and the treatment of personnel and their effects. In order not to interfere with the efforts to increase commercial relations and to popularize these much-maligned islands, it is necessary that this work, while performed in conformity to existing laws and regulations, be accomplished with as little friction or annoyance as possible. If the present favorable health conditions continue to prevail, it is hoped that much of the present inspection and disinfection may be discontinued in the near future. Extensive treatment and disinfection of ships and personnel bound to the United States naturally gives the impression abroad that the islands are badly infected and that the real facts are being suppressed.

During the larger part of the year, on account of cholera being present in the islands, special precautions were taken, and until October 22, 1906, sailing vessels bound for the United States, on account of the possibility of their being rendered helpless if a few members of the crew were seized with this disease, were held five days under observation before sailing.

Seventy-nine vessels coming under the provisions of the United States quarantine laws and regulations were granted consular bills of health for ports on the mainland of the United States, or on its insular possessions. Eighteen of these vessels were partially disinfected. Nine were fumigated throughout before bills of health were issued.

Army transports—17 in number—were partially disinfected, their crews and steerage passengers bathed, and their effects disinfected. They carried a total of 3,213 crew, 1,869 cabin passengers, and 5,633 steerage.

All vessels proceeding to United States ports, including the crew and passengers, were inspected prior to sailing, and the bills of health completed on board the vessels. All ship's manifests were viséed after being compared with the boat notes, and permits for loading cargo issued by the office staff after due inspection and investigation before the cargo was loaded on the vessel.

During the year 27,270 pieces of baggage were disinfected and 26,291 passed after inspection, making a total of 53,561 pieces of baggage treated and labeled according to the regulations.

In addition, the source, condition, and liability to convey infection of 409,630 pieces of miscellaneous cargo were investigated and certified before being allowed to be loaded on vessels bound for the United States. In the inspection, 2,421 pieces of cargo were required to be disinfected, and in a large number of cases permits for shipment were refused. The investigation and certification of cargo and effects for shipment to the United States imposes a vast amount of difficult and exacting office and outdoor work on the personnel of the service. The work has been accomplished very satisfactorily, and no complaints have been heard regarding the manner or promptness in which the same is conducted.

NONQUARANTINABLE DISEASES OBSERVED ON VESSELS.

On arriving vessels among the crew and passengers almost every ordinary disease has been observed during the past year. The trans-Pacific liners and transports are generally from twenty-three to thirty-five days out from San Francisco, or other Pacific coast ports, and always have a large hospital list, and not infrequently a number of deaths. A majority of the orientals returning from San Francisco to China via Manila are old, sick, or crippled men, who are returning to their birthplaces to spend their remaining days in order to die in their own country. This custom greatly increases the number of sick and usually augments the death list. Among the specific infectious diseases noticed were scarlet fever, diphtheria, typhoid fever, pneumonia, measles, mumps, cerebro-spinal meningitis, and tuberculosis. Many of these diseases often resemble some of the quarantinable diseases, so that a diagnosis is often difficult, as well as one of considerable responsibility.

The number of cases of sickness found among the members of the crews of interisland vessels has gradually diminished during the past four years. The effects of the constant fight against insanitary conditions on vessels has so improved the crew's living quarters that many diseases have practically disappeared. When the service began to inspect vessels in the islands, skin diseases were found in almost every occupant of the forecabin, and beri-beri was present in a large percentage of the vessels. Now, skin diseases the result of filth and insanitary quarters are practically absent, and beri-beri is seen very seldom. The frequent fumigation of the forecabin with sulphur dioxide gas and the subsequent painting rendered necessary has improved the sanitary condition of the crews' quarters, and the better quality of the food now used has no doubt had effect in lessening disease.

AID TO OTHER SERVICES.

1. *Board of marine examinations.*—The examination of candidates for license as masters, mates, and engineers on American vessels in the islands, under the provisions of act 780, has again been conducted by the service during this year. The examination, as previously reported, is a complete physical examination, and corresponds to the examinations made by boards of medical officers in the United States of candidates for officers in the Revenue-Cutter, Life-Saving, and similar services.

During the year 445 examinations were made, 366 persons having been passed, 45 rejected, and 44 given provisional certificates.

2. *Immigration service.*—The officers of the service on quarantine duty at the ports of entry inspected 7,708 aliens, and certified 96 as being afflicted with excludable diseases, or conditions which would affect their ability to earn a living. Of the number certified, 45 were deported, 6 released, and 45 remain in the islands at the close of the year awaiting decision of appeals or deportation.

3. *Bureau of health.*—Vessels in port and in the river were disinfected on account of diseases occurring thereon. Water transportation was furnished for carrying out a number of important functions of the sanitary work in the river and bay. Hides, animal food products, etc., were certified for landing and shipment.

4. *Bureau of education.*—At the request of the director of education, students bound for the States to complete their education, some at private expense and others at government expense, were given a rigid physical examination before being finally appointed to scholarships.

5. *Bureau of navigation.*—Officers and men are examined to determine their fitness for promotion, or for appointment to positions in the coast guard, or light-house service, either as officers, cadets, or keepers. Cutters and launches were disinfected and fumigated.

6. *Coast and geodetic survey.*—One physical examination was made of an employee of that service.

7. *Bureau of posts.*—During the outgoing quarantine, the post-office bureau was extended every aid practicable, both at Manila and Mariveles, for the expeditious shipment of mail. Incoming mail steamers were boarded out of regular hours and mail allowed to be landed.

8. *Bureau of civil service.*—Special physical examinations were made at the request of the civil-service board of applicants for certain positions. Examination papers were examined and rated.

9. *Panama Canal Zone.*—Household goods and baggage bound for the Canal Zone were inspected and passed, or disinfected and certified. Travel to the Zone being via the States, much of the cargo destined for the Zone is treated with the other cargo being shipped to the United States.

10. *Weather bureau.*—Storm signals are displayed at the quarantine station at Mariveles, as directed by wire from the Manila Observatory. This service is greatly appreciated by the shipping, because Mariveles Bay is a safe and much-used refuge for vessels when typhoons are threatening.

11. *United States Army.*—Transports were disinfected when requested on account of measles or other minor communicable diseases being aboard, and fumigated when desired. Launches were fumigated to rid them of vermin.

12. *United States Navy.*—Three vessels were disinfected, including one of the largest in the Navy. One vessel was held under service observation for fourteen days at the request of the naval authorities.

13. *Bureau of Agriculture.*—Upon request of the bureau of agriculture, vessels which have carried diseased cattle have been regularly disinfected.

INTERISLAND QUARANTINE.

At the beginning of the fiscal year 1907 an outgoing quarantine of two days was imposed at Manila on all vessels leaving the port for other interisland ports, except those near Manila, in order to prevent, if possible, cholera from being conveyed by vessels from Manila to other Philippine Island ports. In view of the experience gained in former epidemics of cholera, and in order to reduce the interference with and delays to shipping as much as possible, everything commensurate with safety was done to lessen the detention period and to expedite the departure and arrival of vessels. The quarantine detention was served by vessels in Mariveles Bay, the work of inspection being done by the officers on duty at the Mariveles quarantine station. Cholera occurred on three vessels while in detention prior to sailing. Vessels and personnel were disinfected and held for five days. No secondary cases occurred.

Beginning August 14, 1906, vessels proceeding to ports at which army medical officers were stationed and were permitted to act as quarantine officers by the commanding general, Philippines Division, were allowed to leave Manila without quarantine, the voyage to count as the quarantine period, with a rigid inspection at the first port of call.

On October 3, 1906, the detention period was reduced from two days to twenty-four hours for the majority of vessels. For vessels bound for ports at which service quarantine officers were stationed no detention was required before sailing.

On November 10, 1906, all outgoing quarantine restrictions at Manila were removed, except that vessels were required to obtain bills of health on which a certificate was placed, signed by the master of the vessel, agreeing to return at once to a quarantine station if suspicious illness occurred on board, and not to allow prohibited foodstuffs to be brought aboard his vessel either by crew or passengers.

After May 1, 1907, masters of vessels commencing a voyage from one port in the Philippine Islands to another in the Philippine Islands were not required to obtain bills of health, thus removing all quarantine restrictions on outgoing vessels.

At Iloilo an outgoing quarantine of three days was imposed on September 14, 1906, and continued in force, with modifications to meet the local conditions, until November 5, 1906.

As soon as conditions warrant, it is hoped that the inspection of interisland vessels, upon their arrival at ports of entry, may be discontinued.

The circular letters^a embodied in this report outline in considerable detail the outgoing quarantine measures and regulations which it was necessary to promulgate, both at Manila and Iloilo. At Cebu no outgoing interisland quarantine was imposed during the year.

FLOATING EQUIPMENT.

The 6 vessels purchased for the service in the Philippines—4 launches and 2 barges—were in commission all the year. The launches *Zapote* and *Mercury* were stationed at Manila, the former as the regular quarantine boarding launch and the latter as a relief boarding boat. The two launches are operated by a crew of 11 men. Both launches have rendered excellent service, and are in good condition.

The launch *Mariveles* and the two disinfecting barges, *Esmeralda* and *Proteccion*, are stationed at Iloilo. The latter was removed from Cebu to Iloilo, because the completion of the Cebu quarantine station made the continuance of a disinfecting barge at Cebu unnecessary. The launch was in commission all the year, except a few weeks while the boiler was being retubed. The barge *Esmeralda* needs a new rudder, but otherwise is now in good condition, the keel and hull having been thoroughly repaired during May, 1907. The barge *Proteccion* was used to good advantage during the late epidemic of cholera and the outbreak of typhoid fever among the troops at Iloilo. The extra barge at Iloilo is held in reserve, and is available for use at any time should occasion arise requiring a disinfecting plant at any of the other ports in the islands. The plant will be left at Iloilo, safely berthed in the river until it is needed elsewhere.

The launch *Sanidad*, at Cebu, was recently repaired, including a new propeller shaft. The vessel is in good condition, and is used as a supply boat for the Cebu station, as well as a boarding boat.

The floating equipment was very economically administered. The many severe storms which prevailed fortunately did no serious damage to any of the vessels of the service. No large repairs were necessary, and none but minor repairs for the proper care and preservation of the several vessels and their equipment are anticipated for the coming year.

QUARANTINE STATIONS.

The disinfection and detention station at Mariveles was found equal to all demands made upon it. During the continuance of the outgoing interisland quarantine the station and bay were a scene of considerable activity. The station buildings have been kept in good repair by the employees of the station. The main wharf was extensively repaired during the period from July to December, 1906; and during June, 1907, the bureau of public works began the renewal of over 100 piles in the body of the main wharf and in the clusters of fender piles along its front. Creosoted pine piles are being used.

^a These have been omitted, and are on file in the Bureau of Insular Affairs, War Department.

The incendiary fire, which destroyed the major portion of the adjacent village of Mariveles, did not do any damage to the station. The structures at Mariveles suffered no serious damage during the severe typhoons which prevailed during 1906. Several of the wooden buildings are becoming old and will not much longer withstand the elements. They should be replaced with stone buildings, and, since an inexhaustible supply of good stone is available on Mariveles Bay, the project is a very feasible one.

The station at Cebu is the headquarters of the service at that port. The office of the service is located on Caut Island, and the boarding of incoming vessels is conducted from the station. The buildings have been maintained in a good state of repair and preservation. The equipment of the station is now practically complete, and for adaptability and efficiency the Cebu station ranks with any in the service.

IMMIGRATION.

There were 7,708 aliens inspected by officers of this service at ports of entry in the Philippine Islands. Of this number, 6,873 were inspected at Manila, 379 at Iloilo, 107 at Cebu, 154 at Zamboanga, and 195 at Jolo, with 88 rejections at Manila and 8 at Iloilo. Of the total of 96 certifications, there were deported 45; pending action of court, 45; released, 6.

The total number inspected for the year is larger than at any time since the medical inspection of aliens was commenced in the Philippine Islands in 1903, but this does not necessarily mean that there has been a larger immigration than in previous years. Until January 1, 1907, it was held in the Philippine Islands that Chinese did not come under the provisions of the immigration act of 1903, and, consequently, they were not inspected from the immigrant standpoint. Since January 1, 1907, however, the Philippine authorities have held that they did come under the provisions of the immigration law, and since this latter date there have been 3,474 Chinese inspected, which would indicate that the actual number of aliens entering the country, calculated upon the same basis as in former years, was 4,334. The largest number reached heretofore was in 1904, when 6,111 were recorded.

During the first few weeks in January the percentage of rejections among the Chinese was very high, but as soon as the steamship companies understood that they would be fined if they brought aliens to ports in the Philippines with diseases that could have been detected at port of embarkation, they immediately made arrangements with private physicians to have such alien passengers inspected prior thereto. The effect of this action was immediately noticeable, there having been a steady reduction. During the month of June the percentage of rejections was very small.

The causes of rejections were: Trachoma, 87; poor physique, 2; hernia, 1; senility, 1; syphilis, 5. The percentage of rejections was 0.014, which compares very favorably with the figures reached in former years, especially when it is considered that the number was unusually increased during January, 1907, by the sudden application of the law against Chinese not being immediately understood.

The statistical tables^a for the year are submitted herewith under the station to which they pertain.

EXPENDITURES.

At the close of the fiscal year 1906 all unexpended balances, amounting to ₱4,894.64 Philippine currency, reverted to the insular treasury. Fiscal year 1906 funds to the amount of ₱27,855.56 were transferred to fiscal year 1907 funds for the liquidation of the obligations of the fiscal year 1906 remaining unpaid June 30, 1906. The general appropriation for the fiscal year 1907 was ₱125,000, to which refunds to the amount of ₱4,764.50 were made, making a total of ₱157,620.06 available for expenditure during the fiscal year 1907, of which ₱27,855.56 were for obligations of the fiscal year 1906, and ₱128,764.50 for fiscal year 1907 authorizations.

The disbursements were ₱115,196.30. The total expenditures authorized by the service amounted to approximately ₱153,298.06, leaving an unexpended balance of about ₱4,222. The latter amounts may not be strictly accurate, because the bills for supplies ordered from the United States by the bureau of

^a These tables have been omitted and are on file in the Bureau of Insular Affairs, War Department.

supply have not been received, and until the freight, landing charges, etc., are known, exact figures can not be given. These authorized expenditures include all expenses of the maintenance and operation of the service, as well as those for repairs and improvements.

The financial statement submitted at the end of this report shows in considerable detail the purpose for which the funds were expended and the stations for which the expenditures were authorized.

ILOILO.

At Iloilo all incoming vessels have been subject to inspection, except those from Panay and Negros. The sanitary condition of the interisland vessels is gradually improving, but there is yet much to be done. Were it not for the constant surveillance of the service over these vessels, it is believed that it would be next to impossible to travel on them with any degree of comfort or safety.

All the interisland vessels plying in and out of this port were fumigated once during the year to free them from rats and vermin. Steamers from plague-infected localities are treated with great care, in order to prevent rats from coming ashore from them. Rat guards are used on all lines, and at night the gangplanks are removed and vessels are eased away from the wharf. When this can not be successfully effected, vessels are required to lighter their cargoes in the bay.

One vessel was treated which had cholera on board. After the usual disinfection and detention no further cases occurred.

The vaccination of crews was continued, and to this procedure is no doubt due the fact that no smallpox-infected vessels entered the port of Iloilo.

A mild outbreak of cholera occurred in and about Iloilo during September, 1906, and an outgoing quarantine was instituted September 15 of that year on all vessels leaving Iloilo for other ports in the Philippines, except Manila, to prevent the spread of the disease to the adjacent and other islands of the archipelago. This quarantine, with such modifications as were deemed safe, was continued in force until November 28, 1906. The detention proved eminently successful, as no cases were carried from Iloilo to other places. From the northern part of the province cholera was carried to Negros by a sailing vessel.

The measures instituted for the management of the outgoing quarantine are outlined in considerable detail in the circular letters which were issued from time to time at Iloilo and copies of which are embodied in this report.^a

CEBU.

The only quarantinable disease encountered at Cebu was a case of smallpox imported on the British steamer *Mazagon*. The usual treatment was given the vessel and personnel, and no spread of the disease from the vessel or its crew occurred.

The vaccination of the crews of interisland vessels was continued, and it is encouraging to note the absence of smallpox from among that class of persons. In former years it was no uncommon sight to see an entire crew marked from having had smallpox.

During the presence of cholera in Manila and Iloilo in more or less epidemic form considerable anxiety existed at Cebu lest cholera should again be introduced at that port. The efforts of the service fortunately met with success, and no cases of cholera occurred in Cebu.

Vigorous measures were instituted against vessels from plague-infected ports. All such vessels were required to use rat guards while at the wharf and to unload only during daylight. They were fumigated in order to destroy the rats and vermin on board, it being a well-established fact that measures which destroy rats and vermin prevent the spread of plague.

The station at this port clearly demonstrated its adaptability and efficiency in the treatment of a number of large vessels from infected ports.

At Cebu all arriving vessels except those from near-by Cebu ports are inspected on arrival. The masters of the vessels are slowly realizing under constant instruction and pressure that it is of vital importance that they maintain their ships in a clean and sanitary condition.

^a These have been omitted and are on file in the Bureau of Insular Affairs, War Department.

Arriving aliens were examined in accordance with the immigration laws and regulations.

Thirty-seven masters, mates, and other officers of coastwise vessels were physically examined, in accordance with the provisions of act 780, and 4 were found to have defects which would unfit them for the positions for which they sought licenses.

CAVITE AND OLONGAPO.

At the naval stations at Cavite and Olongapo surgeons of the Navy are detailed as quarantine officers, and carry out the United States quarantine laws under the direction of the chief quarantine officer for the Philippine Islands. The quarantine work was done in a very commendable manner, and the convenience resulting by having the inspections made at the naval stations instead of at Manila was much appreciated by the Navy.

At Cavite 18 vessels of the Navy, either regular naval vessels or chartered, arrived from foreign ports, were inspected, and granted pratique upon arrival. Smallpox occurred on two cruisers, and cerebro-spinal meningitis made its appearance on the *Maryland*, and all 3 vessels were remanded to Mariveles for disinfection.

At Olongapo 13 vessels, including the dry dock *Dewey*, arrived from foreign ports, and were inspected in the usual manner. No infected vessels arrived at Olongapo. During the cholera epidemic vessels from infected Philippine ports were also inspected by the quarantine officer at Olongapo to protect the garrison of marines there.

The tables of statistics of the work done at Cavite and Olongapo are submitted on the following pages.^a

ZAMBOANGA.

The inspection station at Zamboanga has increased considerably in importance. Zamboanga is the commercial center for the immense island of Mindanao, which is now pacified, and the increase of peaceful pursuits, together with the presence of a larger body of troops, has increased its trade. Several lines of large steamships now make Zamboanga a port of call, and a number of vessels from foreign ports call there after making a call at Manila, Iloilo, or Cebu. Only those vessels which arrive directly from foreign ports are inspected by the acting assistant surgeon in command.

During the year 62 vessels from foreign ports were inspected. They carried 4,472 crew and 1,490 passengers. No infected vessels arrived, and while cholera was present in other Philippine ports, the quarantine officer also inspected inter-island vessels for the protection of the army, of which he is an officer.

One hundred and ninety-five aliens arrived and were inspected according to the rules of the service and the immigration laws. No aliens were certified as being afflicted with excludable diseases, or infirmities which would affect their ability to earn a living.

JOLO.

At the port of Jolo, which is the port of entry of the Sulu Archipelago, only vessels arriving directly from foreign ports are inspected by the service. No lines of steamers make Jolo a regular port of call. The trade is mostly with vessels from Borneo, the Celebes, or Singapore.

Seventeen vessels directly from foreign ports arrived, and were inspected in accordance with the United States quarantine laws and regulations. No infected vessels arrived.

The service operations were in charge of Acting Asst. Surg. Chas. B. Ewing, major and surgeon, U. S. Army.

During the year 154 immigrants arrived and were inspected, in accordance with the United States immigration laws and regulations. No diseases or conditions requiring certification were detected.

The port of Jolo has remained free from quarantinable diseases, and with the exception of a few cases of smallpox, the surrounding country and islands have continued in a satisfactory sanitary condition.

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

SUMMARY OF QUARANTINE TRANSACTIONS AT MANILA, P. I., DURING THE FISCAL YEAR ENDED JUNE 30, 1907.

Total number of vessels inspected.....	3, 472
Total number of vessels detained in quarantine.....	411
Total number of vessels disinfected.....	63
Total number of vessels fumigated to kill vermin.....	116
Total number of bills of health issued.....	2, 771
Total number of pieces of baggage disinfected.....	43, 884
Total number of pieces of baggage inspected and passed.....	30, 414
Total number of pieces of miscellaneous cargo certified.....	319, 639
Total number of cases of quarantinable diseases detected on vessels:	
Cholera.....	3
Smallpox.....	3
Total number of persons detained in quarantine.....	23, 403
Total number of crew inspected.....	153, 141
Total number of passengers inspected.....	92, 445
Total number of persons vaccinated.....	4, 099
Total number of persons bathed and effects disinfected.....	15, 942

GRAND SUMMARY OF THE QUARANTINE TRANSACTIONS IN THE PHILIPPINE ISLANDS BY THE U. S. PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE DURING THE YEAR ENDED JUNE 30, 1907.

Total number of vessels inspected.....	6, 941
Total number of vessels detained in quarantine.....	621
Total number of vessels disinfected.....	69
Total number of vessels fumigated to kill vermin.....	161
Total number of bills of health issued.....	3, 548
Total number of pieces of baggage disinfected.....	44, 452
Total number of pieces of baggage inspected and passed.....	30, 452
Total number of pieces of miscellaneous cargo certified.....	409, 630
Total number of cases of quarantinable diseases detected on vessels:	
Cholera.....	4
Smallpox.....	4
Total number of persons detained in quarantine.....	26, 748
Total number of crew inspected.....	257, 935
Total number of passengers inspected.....	128, 931
Total number of persons vaccinated.....	4, 785
Total number of persons bathed and effects disinfected.....	16, 374

FINANCIAL STATEMENT.

RECEIPTS AND EXPENDITURES, QUARANTINE SERVICE APPROPRIATIONS, PHILIPPINE ISLANDS, EXPRESSED IN PHILIPPINE CURRENCY.

I.

(A) GENERAL APPROPRIATION, BUREAU OF QUARANTINE SERVICE.

Balance, former fiscal year appropriations.....	₱27, 855. 56	
Appropriation, act No. 1527, fiscal year 1907.....	125, 000. 00	
Collections available for expenditure.....	4, 764. 50	
Total available.....	157, 620. 06	
Expended during the fiscal year 1907.....		₱113, 776. 29
Unexpended balance June 30, 1907.....		43, 843. 77
Total.....		157, 620. 06

(B) APPROPRIATION FOR PUBLIC WORKS AND PERMANENT IMPROVEMENTS.

Balance appropriation, act No. 1342, Cebu quarantine station.....	₱3, 009. 27	
Total available.....	3, 009. 27	
Expended during the fiscal year 1907.....		₱1, 420. 01
Unexpended balance.....		1, 589. 26
Total.....		3, 009. 27

II.

STATEMENT OF FUNDS EXPENDED DURING FISCAL YEAR 1907.

Expended from general appropriations.....	₱113, 776. 29
Expended from public works appropriations.....	1, 420. 01
Total expended.....	115, 196. 30

III.

EXPENDITURES.^a

IV.

TOTAL EXPENDITURES FOR THE QUARANTINE SERVICE IN THE PHILIPPINE ISLANDS,
JULY 1, 1906, TO JUNE 30, 1907.

Compensation of personnel.....	₱72, 931. 34
Office and general service expenses.....	3, 093. 71
Launch and barge supplies and repairs.....	12, 492. 94
Station supplies and disinfectants.....	11, 266. 12
Repairs to buildings and wharfs.....	12, 634. 75
New construction and new equipment.....	2, 777. 44
Total expenditures, Philippine currency.....	115, 196. 30

V.

EXPENDITURES AS PER CLASSIFICATION ADOPTED BY THE PHILIPPINE COMMISSION.

1. Real estate.....	
2. Permanent improvements.....	₱3, 416. 41
3. Supplies (in 2, 4, and 7).....	
4. Administration, salaries, and wages.....	72, 667. 34
5. Administration, miscellaneous expenses.....	19, 937. 28
6. Maintenance, salaries, and wages.....	264. 00
7. Maintenance, miscellaneous expenses.....	18, 911. 27
Total.....	115, 196. 30

VI.

APPROPRIATIONS FOR THE BUREAU OF QUARANTINE SERVICE AVAILABLE FOR
THE FISCAL YEAR ENDED JUNE 30, 1907, WITH EXPENDITURES AND BALANCE,
PHILIPPINE CURRENCY.

Title of appropriation.	Amount of appropriation available.	Expenditures.
Former fiscal years, administration expenses.....	₱27, 855. 56	₱15, 799. 72
Act No. 1527, administrative expenses.....	129, 764. 50	97, 976. 57
Act No. 1342, Cebu quarantine station.....	3, 009. 27	1, 420. 01
Total.....	100, 629. 33	115, 196. 30
Unexpended balance, June 30, 1907.....		₱45, 433. 03
Retained against outstanding obligations, etc.....		45, 433. 03

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

VII.

EXPENDITURES BY STATION.

MANILA.

General service expenses	₱27,700.36	
Launch expenses	12,613.85	
New station equipment	0.00	
		₱40,314.21

MARIVELES.

General service expenses and supplies	28,683.99	
Repairs to buildings and wharfs	12,239.93	
New construction and equipment	1,027.82	
		41,951.74

ILOILO.

General service expenses	5,385.53	
Launch and barge expenses	8,019.00	
New station equipment	0.00	
		13,404.53

CEBU.

General service expenses	10,164.02	
Launch expenses	5,867.93	
Repairs to buildings, wharf, and reservation	452.55	
New construction and new equipment	1,461.32	
		17,945.82

JOLO.

General service expenses	360.00	
		360.00

ZAMBOANGA.

General service expenses	1,220.00	
		1,220.00
Total expenditures		115,196.30

Respectfully submitted.

VICTOR G. HEISER,
*Passed Assistant Surgeon,
 Chief Quarantine Officer for the Philippine Islands.*

To the SECRETARY OF THE INTERIOR,
Manila, P. I.



APPENDIX C.

REPORT OF THE DIRECTOR OF FORESTRY.

DEPARTMENT OF THE INTERIOR,
BUREAU OF FORESTRY,
Manila, P. I., June 30, 1907.

SIR: I have the honor to submit herewith a report of the work of the bureau of forestry for the period July 1, 1906, to June 30, 1907.

The work during the past year has progressed much more satisfactorily than in former years. With two exceptions the foresters have completed two years of service in the districts under their charge, and all will continue service in that part of the islands now so well known to them. It takes a forester at least one year to make one thorough inspection of his district where logging operations are being conducted.

REPORT OF THE FORESTERS' CONFERENCE.

The second annual conference of the foresters of the Philippine bureau of forestry was held recently in Manila. This annual conference of the directing members of the service following the close of each fiscal year is becoming more useful and necessary each year in settling the forest problems which arise in the different districts. The discussion of forestry questions at this conference resulted in many recommendations for the betterment of the service. The director of forestry presided at the meeting and opened the conference with an address on the work of the bureau, reviewing the former instructions given to the foresters and expressing his satisfaction on the amount of work done during the year.

The following foresters were present: Messrs. William Klemme, Theo. Zschokke, H. M. Curran, William H. Kobbe, F. L. Pray, M. L. Merritt, and H. D. Everett. Messrs. Whitford and Hutchinson were unable to attend, the former being absent on a vacation in the United States and the latter being engaged in an important piece of field work in Mindanao.

Each forester read his annual report, which was a progress report showing what had been done in his district during the past fiscal year. These were especially interesting, as the past year was the first entire year's work done by them since the reorganization of the bureau in 1905, which made the work of the bureau more technical than administrative. The reports showed what had been done and how it had been done, naturally causing much valuable discussion. In spite of the many difficulties encountered by the foresters the amount of work of permanent value accomplished was gratifying.

All reconnaissance sketch maps were left by each forester in the map section for compilation, as well as information concerning means of communication in their districts.

All applications for licenses for the coming year were submitted, with recommendations in each case.

A programme for the conference arranged the order in which the topics for discussion would be taken up.

The conference then proceeded to discuss in detail all phases of the present work, criticising methods and making many suggestions to increase the efficiency of future work.

Representatives of the bureau of internal revenue, bureau of lands, bureau of science, and of the Manila lumbermen were present when matters concerning their work were discussed.

Considerable attention was given to devising means of securing a competent Filipino force to carry on the work which is becoming more technical. As the establishment of a regular training school for rangers is at present impractic-

cable it was decided to secure student assistants from the public schools, preferably the trade schools, who, after they have shown their capacity and fitness, shall enter the service as rangers.

The most important work accomplished by the conference was the reorganization of the field work of the bureau. The title of the division of forest products was changed to the division of forest investigation, and a new division was organized, to be known as the division of forest administration. Each division is under the charge of a committee of three foresters which plans its work. The division of forest administration, with a force of 6 foresters and about 18 rangers will take charge of the administrative work, such as pertains to licenses, violations of the forest act, etc., and will also do as much special work of investigation as possible in cooperation with the division of forest investigation. The division of forest investigation, with a field force of 3 foresters and 3 rangers, will carry on special studies and make special maps in all parts of the islands. By this new organization it is expected that the work can be done in a more systematic manner.

The privilege of the free use of timber which was granted to the residents of the islands October 19, 1905, for a period of five years, was discussed in great detail. In addition to the opinions of the foresters on the question, letters were read from important lumbermen dealing with this privilege. The conference decided that the privilege as granted, without regulation or restriction except regarding first group timber, not only made proper administration of the forest most difficult, but tended to establish a servitude or forest right which would be found almost impossible to abolish after the lapse of years.

Homesteads and *caliñgins* (clearings) were thoroughly discussed as usual. It was decided that radical changes were necessary. Permits should no longer be required for *caliñgins* on private lands. On public lands few or no *caliñgins* should now be granted. People desiring to make *caliñgins* should be required to make out homestead applications for the land. In this way the bureau will encourage permanent occupancy of small farms instead of shifting cultivation within the forest regions.

Interesting additional recommendations which were discussed and adopted show the character of the conference.

1. That the map work be pushed during the coming year in view of its importance at this time. The principal mapping will be the land classification or plat maps. In addition a beginning will be made in establishing boundaries for possible future reserves, detailed surveys to be made of a few important cutting areas.

2. That every possible effort be made to assist Doctor Foxworthy, of the bureau of science, by means of data and wood specimens, in making a definite key for the determination of Philippine woods.

3. That collections of botanical, wood, and other museum specimens be continued, but made with the least possible expense. That seeds of the important trees be collected to be used in nursery experimentation work on the Lamao forest reserve by Mr. Cuzner, of the bureau of agriculture.

4. That identified railroad ties of the following species be secured and placed in the track in cooperation with the Philippine Railway Company, in order to secure definite information regarding their durability and fitness for this use: Toog, dao, apitong, amuguls, cubi, banuyo, malaruhut, agoho, supa, palo, maria, and banaba.

5. That durability tests of Philippine timbers going into construction work be made whenever possible.

6. That the effort to introduce new species of timber into the markets be continued.

7. That a strenuous effort be made to amend act No. 1407, so that the free use of lower group timber shall be regulated by the bureau of forestry.

8. That permits be no longer required for clearings on private lands adjoining the public forests.

9. That permits for *caliñgins* in the public forests no longer be given, and that their place be taken by homesteads.

10. That in order to encourage the utilization of small logs, which should be removed from the forest, each forester certify to the bureau of internal revenue those timber licensees in his district who can be depended upon to cut small logs without felling trees below the diameter limit imposed.

11. That each forester study the minor products collected in his district and their market value in order to assist the bureau of internal revenue in imposing a specific tax on those forest products.

12. That efforts be made to introduce American saws, axes, engines, wire cables, and other logging tools.

13. That timber licensees be required to mark their timber in the forest with their own special mark.

14. That exclusive two-year timber licenses be granted to responsible lumbermen when their cutting areas have been mapped and roughly studied by a forester.

15. That foresters inspect personally the cutting areas of large operators, leaving only the inspection of unimportant licensees to rangers.

16. That the foresters make careful observations during the coming year on the influence of deforestation on the climate and waterflow, these observations to be embodied in their next annual report.

17. That the printed forms used by the bureau be amended in such a way as to lessen the paper work of the field force as much as possible.

18. That the Manila office take as much of the clerical work as possible from the district officers, especially in regard to circular letters.

19. That certain forest reserves be recommended as soon as data are at hand sufficient to limit their boundaries, and to justify the request for their reservation.

20. That an educational propaganda be inaugurated; first, through the schools; second, by means of stereopticon lectures; third, through the newspapers, and fourth, through general discussion.

21. That in order to arouse interest in Philippine forestry in the United States, frequent articles or reports be sent to the American forestry magazines for publication.

22. That a course of forestry be established in the new Philippine college of agriculture.

23. That a handbook of forestry for rangers be completed as soon as possible by the committee on publication.

24. That the annual conference of Philippine foresters be held each year in July, at which time, all foresters can be assured of having at least one month in the Manila office.

The following committees were appointed by the director of forestry: Administration—H. D. Everett, Wm. H. Kobbe, Wm. Klemme; Forest Investigation—H. N. Whitford, H. M. Curran, and M. L. Merritt; Publication—H. N. Whitford, H. D. Everett, Wm. Klemme.

H. D. EVERETT,
Recorder.

REDUCTION IN GOVERNMENT CHARGES ON TIMBER IN CERTAIN PROVINCES.

Act No. 1575, amending the forest act (January 1, 1907), provides but one scale of prices on government timber in all provinces. Formerly the government charges on timber in certain provinces were almost double that in others. The lower scale of prices was adopted. At present the government charges on timber ranges, approximately, from \$1 to \$5 U. S. currency per M B. M.

PHILIPPINE FOREST ACT DOES NOT APPLY TO UNITED STATES MILITARY RESERVATIONS.

The following letter was received during the month of November, 1906:

WAR DEPARTMENT,
BUREAU OF INSULAR AFFAIRS,
Washington, October 13, 1906.

SIR: With reference to letter from your office of the 7th of July, inclosing excerpt from the minutes of the Philippine Commission of July 3, 1906, which quotes an opinion of the attorney-general of the Philippines, that the Commission has no authority to extend the forestry laws over the United States reservations, and contains a resolution directing that the matter be submitted to the Secretary of War for final determination, I have the honor to state that upon the request of this department the Attorney-General of the United States has rendered an opinion in which he holds that the Philippine government can not extend its forestry laws to the military reservations in those islands. A copy of this opinion is herewith inclosed.

Very respectfully,

A. D. WILCOX,
Chief Clerk.
(In absence of Chief of Bureau.)

The honorable the GOVERNOR OF THE PHILIPPINES,
Manila, P. I.

THE FREE-USE PRIVILEGE.

The free-use privilege has been the source of much complaint from the lumbermen and from forest officers. In many cases it is impossible to fix the blame for violating the forest act. The free-use men cut when, what, and where they please. Undersized trees of the first and other groups are taken; valuable trees felled and only a small part of them utilized; valuable forest tracts are being devastated in not a few but in many parts of the islands, and it is impossible, in the majority of cases, to fix the blame.

The residents of these islands should be allowed to take all the timber and other forest products they need for their own personal use free of charge and without license, but the bureau of forestry should be authorized to indicate to these people the forests where they can get these products, and the forests in which such free use is prohibited. The matter was referred to a committee of three foresters to submit a report which would include an amendment to act No. 1407, granting the free-use privilege.

The report submitted is as follows:

REPORT OF THE COMMITTEE ON FREE-USE PRIVILEGES.

It is the opinion of this committee that every home builder in the Philippine Islands should have a similar privilege to that granted settlers in the vicinity of national forests in the United States. There each settler is allowed an amount of timber each year not to exceed a fixed amount sufficient for his needs to be used by him in house building, repairs, fencing, etc. To obtain this timber he must apply to local forest officers and remove the material desired from such places and in such a manner as not to injure the public forests.

A similar right has been granted the Filipino people, but without the restrictions necessary to insure the safeguarding of public interests. The Filipinos may enter any public forest and cut such timber as they desire without restriction as to amount or sizes. Twelve of the more valuable woods, comprising what is known as the first group, are protected by the present law, but these, as a group, furnish less than one-sixth of the total cut of the islands, and the greater part of this one-sixth is from three to four species cut in the more inaccessible and thinly inhabited regions. In the thickly populated districts these twelve timbers have almost disappeared, and the bulk of the cut comes from lower group trees. It is from these species of the lower groups that the future supplies of the islands must be drawn. They are of more importance to the agricultural and commercial development of the islands than the first group timbers.

Rapid economic development depends on cheap construction timbers, and not on fancy woods, or expensive woods suited to special uses. Timber that will furnish the necessary construction timbers for Philippine industrial development is found in the existing forests, but is being rapidly destroyed by the present unrestricted cutting.

We are required to-day carefully to inspect and regulate the cutting of 1,000 timber licensees whose work is in the main satisfactory and is not materially injuring the forests, and we are forbidden to interfere with the cutting of a population of 7,000,000, of whom 1,500,000 are grown males. These men may enter the forests, cut and waste at will the principal timber resources of the islands.

The bureau of forestry was called into existence to perpetuate the forests by wise use, to give to the people of these islands timber and fuel supplies for all times, and to safeguard its agriculture by caring for watershed forests. Under the present law the hands of the bureau are tied, and the policy as embodied in this law, allowing the free and unrestricted use of timber, if persisted in, means the ultimate waste and destruction of the islands' timber resources and a checking of its future economic development.

In view of the shortcomings of the present law its amendment is suggested. This amendment should contain such part of the following rough draft as, in the opinion of the Philippine Commission, may best protect the public interests and aid in home building:

AN ACT AMENDING SUBSECTIONS (b) AND (c) OF SECTION NINE OF ACT NUMBERED FOURTEEN HUNDRED AND SEVEN, SO AS TO PERMIT THE FREE USE OF FOREST PRODUCTS AND PROVIDING FOR THE REGULATION THEREOF.

By authority of the United States be it enacted by the Philippine Commission, that:

Section 1. Subsections (b) and (c) of section 9 of act 1407 be, and the same are hereby, amended so as to read as follows:

Sec. 9 (b). Every resident living in or near the public forests, and who is in need of building material, fuel, fencing, or other forest products, stone or earth, for the personal use of himself or his family, may, without written permit, enter such public forest as the director of forestry, with the approval of the secretary of the interior, shall designate, and may remove, free of charge, an amount of timber not to exceed fifteen cubic meters in any fiscal year, and such amount of other products as is actually necessary for his personal use. The director of forestry, with the approval of the secretary of the interior, shall prescribe species, sizes, and manner of removal of forest products, stone or earth, and may, if the public interests demand it, withhold from any individual the right, under this act, to the free use of timber in the public forests.

(c) The director of forestry, with the approval of the secretary of the interior, may, from time to time, set aside certain tracts of public land, which shall be known as communal forests, and be assigned to certain communities, whose free-use privilege shall be confined solely to these areas, subject to the limitations prescribed in subsection (b). These forests shall be on lands more suitable for forestry than for agriculture, and shall be administered by the director of forestry, with the approval of the secretary of the interior, under such rules and regulations as he may deem wise. The object of the administration of these communal forests shall be to furnish the people having rights therein with the forest products necessary for their home use and to preserve their water supply. Exploitation of said communal forests for revenue shall be allowed only when the best interests of the forest demand a cutting in excess of local needs. Such exploitation for revenue shall be under license as in other public forests, and forest charges shall be collected in the usual manner and covered into the treasury of the Philippine Islands. These revenues to be returned to the community having rights in the given forest, and be devoted, under the direction of the secretary of the interior, acting with the advice of the superintendent of public instruction, to the public education of the community and the improvement and preservation of its forests.

Sec. 2. The public good requiring the speedy enactment of this bill, the passage of the same is hereby expedited in accordance with section two of "An act prescribing the order of procedure by the Commission in the enactment of laws," passed September twenty-sixth, nineteen hundred.

Sec. 3. This act shall take effect on its passage.

FIRST-GROUP TIMBER TO BE TAKEN WITHOUT CHARGE BY THE RESIDENTS OF THE PROVINCE OF CAGAYAN.

On January 8, 1907, a resolution was passed by the Philippine Commission granting authority to any resident of the province of Cagayan to take, free of government charge, under government license for one year, such certain timbers of the first group as he may require for house building, boat building, and other personal use of himself and family.

The forester in charge of this district reports that this privilege has been abused, that the rich residents only are taking advantage of it, and that much valuable undersized timber is being taken, contrary to law.

After this resolution was published six other provinces presented petitions for the free use of first-group timber, but they were not granted.

LARGE LUMBERING OPERATIONS ACTUAL AND POSSIBLE.

At least six large logging and lumber companies are needed in these islands to exploit forest tracts now available for operations. But one such—the Insular Lumber Company—is now operating on the Island of Negros. This company has a twenty-year exclusive privilege on a tract of 69 square miles and will shortly log and mill approximately 60,000 to 70,000 feet B. M. per day. Five or more such companies are needed in the islands to supply the local and foreign markets with timber at more reasonable prices than rule at the present time.

Improved methods of forest exploitation by a few additional large companies would simplify the work of the present small force of forest officers. The thinly forested regions would then be used only as source of supply for the local demand, and the few remaining valuable timber trees in such localities could be protected and retained as centers of reproduction.

At the present time the Philippine market will consume approximately 100,000,000 feet of lumber per year. The amount of Oregon pine taken last year at Shanghai, China, was 85,000,000 feet; at Sydney, Australia, 65,000,000 feet. These three markets should take at least 300,000,000 feet per year of Philippine timber of a grade similar to or better than Oregon pine.

In the forest tracts now available there are large stands of timber close to tidewater. The haul is short, labor is cheap, and stumpage charges are low.

There are a few native woods found in large quantities that are suitable for the making of furniture. These woods should find a market in the United States as well as in the other markets mentioned.

Desirable tracts of public forests are now available and unoccupied in Mindoro, Bataan, Negros Occidental, and Moro provinces. Maps of these districts have been made and estimates prepared, showing the stand, varieties of merchantable timber, possibilities of logging, etc.

The services of forest officers thoroughly acquainted with each tract will be placed at the disposition of prospective logging companies.

NORZAGARAY RIVER IMPROVEMENT.

Forest officers have reported from time to time that large stands of valuable timber were found on the upper waters of the Bayabas and Norzagaray rivers in Bulacan Province. This region is close to the Manila market, but the forests were not exploited to any extent on account of huge boulders in the rivers mentioned, which obstructed the passage of rafts.

A forester of this bureau made an investigation and report. The matter was taken up with the governor of the province and with the bureau of public works.

The work of removing these obstructions was promptly inaugurated by the bureau of public works under authority of a resolution of the Philippine Commission. In a letter from the provincial governor, this office was informed that the obstructions have been removed.

This adds much to the available forest resources of the Province of Bulacan.

RAILWAY TIMBER.

Railway construction in the islands has proved a great stimulus to the timber industry. The railway officials are making an effort to secure native timber when possible. Act No. 1510 of the Philippine Commission gives the railway companies permission, with the approval of the Governor-General, to take timber, stone, and earth from the public lands. Act No. 1544 exempts all such material from internal-revenue taxes, provided the material is taken under license issued by this bureau.

The railway companies require a large amount of timber for general construction, as well as for ties, but find much difficulty in securing it from timber licensees. A glance at the page in the appendix to this report giving the list of amounts of timber taken under license last year by the 20 leading operators will indicate a reason for the difficulty.

The antiquated methods of logging in vogue in these islands by all but one operator will force the railway companies to look to foreign countries for their timber unless some of the timber licensees adopt modern methods.

Forest officers have endeavored to interest the licensees in furnishing material for the railways. Many licensees lacking experience in making ties have found that the proposition is not as lucrative as it at first appeared.

Forester Everett, who has charge of the forests of the Visayan Islands, where there is much activity in railway construction, makes the following statement as part of his annual report.

RAILROAD TIES.

"The cutting of railroad ties has been studied with considerable care by the forester and discussed in several monthly reports. Its importance deserves discussion in this report.

"In October, 1906, the forester received copies of the proposition and specifications of the Philippine Railway Company for ties, with instructions from the director of forestry to interest timber licensees, as it was very desirable that Philippine timber be used as far as possible on the new railroads.

"After reading the proposition, the forester could only think that the Philippine Railway Company did not want to use native woods for ties and had issued a request for them for policy's sake only. Nevertheless, the forest officers of the district have devoted time and effort to stimulate the tie-cutting industry, and the bureau of forestry in general has done everything possible to assist the railway company in securing ties in the islands. Timber licenses have been granted without question to all who had made tie contracts.

"Contracts were made by many licensees in the district and cutting began with enthusiasm. After eight months I believe that tie cutting has almost stopped in this district. The contractors have found it a dangerous and losing business, for the following reasons. (1) The scarcity of the seven kinds of wood which alone are accepted; (2) the severe inspection of the ties by the railway company, and lack of a market for the rejected ties; (3) the low price offered for such valuable timbers in the form of ties.

"There is little doubt that the Philippine Islands can and should furnish the ties for the new railroads. Of what value is the boasted forest wealth of the islands if the railroad timbers are imported from the United States and Australia? The government should investigate the matter before permitting the importation of railroad timbers and discover conclusively why they can not be secured in the islands.

"The fault, in my opinion, does not lie in the restrictions of the bureau of forestry, nor in the nonproductiveness of our forests, nor in the inefficiency of our people, but in the proposition of the railway company. Given a suitable proposition and inspection, there will be little difficulty in the islands furnishing the necessary timber. The present proposition should be amended (1) in regard to price, (2) in regard to classes of timber, and (3) in regard to the inspection.

"1. *Price.*—There is paid ₱1.60 for ties made from molave, dungon, ipil, tindalo, yacal, acle, and betis, delivered on the right of way or in Iloilo and Cebu. It must be borne in mind that the Visayan roads will not pass through or very near any forests where such ties can be cut. Consequently the ties are cut in distant forest regions and transported at high cost to Iloilo and Cebu. There is offered ₱1.30 for ties placed in lots of 1,000 or more on board a boat of the company. I know of no contract made in this district under these terms, as the company prefers the ties delivered by the contractors, and few contractors can get 1,000 ties ahead in one place for evident reasons. In discussing the question of price, take a fair example. A licensee has put in all his available capital and six months of his time and has delivered 1,000 ties in Iloilo at the total cost to him of ₱1,000. Seven hundred ties are accepted at ₱1.60 each and 100 at ₱0.80. The remaining 200 are rejected, and he pays 15 cents government charges on them and is lucky to sell them for ₱0.50 each. He receives a total of ₱1,270. He sees that by six months' hard work, employing a capital of more than ₱1,000 and undergoing considerable risk, he has made ₱270 or ₱45 a month wages, with no interest on his capital, and he is fortunate to have done so well. Then he figures on molave logs. Molave brings ₱1 per Spanish cubic foot in the log. A log containing 12 cubic feet would not make more than four ties. For the log he would receive ₱12 in Iloilo, and if he worked it up into ties, he would get ₱6.40. Consequently many who began cutting ties have changed to cutting logs for the general market.

"2. *Classes of timber.*—Anyone familiar with the forests and timbers of the Philippine Islands recognizes the absurdity of accepting only seven classes of railroad ties. Not only are there other timbers suitable for railroad ties, but confining the list to those seven makes logging so difficult and costly that they can not be cut for the price offered. Further, it is doubtful if there is sufficient accessible timber of those kinds in the Visayas to furnish enough ties for the Panay, Negros, and Cebu railroads.

"3. *Inspection.*—The inspection of ties has not been sufficiently liberal, in view of the fact that tie cutting is a new industry in the Philippine Islands, but has been so strict as to discourage the contractors when a little more consideration and liberality would have done much to have kept them satisfied with terms otherwise so unsatisfactory. One licensee arrived in Iloilo with 650 ties, the result of five months' hard work on a wild coast. Four hundred and fifty were rejected because they were banuyo. Now, although banuyo is

not included in the contract, its general reputation for durability is such that it would have been better to have accepted those 450 ties and kept a contractor than to have almost ruined him by rejecting them."

The purchasing agent for the Philippine Railway Company, upon receipt of the above extract, attended the foresters' conference and discussed the matter of securing railway material. It was recommended by the foresters that—

Additional woods be given a trial as ties.

A list of such woods was submitted, and the railway company agreed to test them if the foresters would cooperate in securing the desired number. The division of forest investigation will attend to this matter during the coming year.

CAÑIGINS.

Forest regulation No. 25, Paragraph A, authorized municipal presidents, in absence of a forest officer, to grant permits to make cañigins (clearing by fire) on public lands. This office was advised from various sources that the municipal presidents were not careful in carrying out this regulation, and that much valuable timber was needlessly destroyed, as a result thereof.

The regulation was amended on December 6, 1906, by authority of the acting secretary of the interior. At present municipal presidents are authorized under the law (section 27 of the forest act) to grant cañigin permits on private woodlands adjoining public forests.

There is no further necessity for granting cañigin permits. The homestead law is very liberal and gives any resident of the Philippine Islands much latitude in selecting a location.

The only persons authorized to grant cañigins on public lands (forest officers) will assist any resident in securing a homestead rather than granting a cañigin permit. In the records of this office there is a list of persons granted cañigin permits and homesteads during the past two years. This list is so indexed that a check may be readily kept on persons making cañigins each year or two.

These devastators of the forest will travel for many miles from their barrios to the edge of the forest and begin operations by ringing the tall trees, and later fell and burn them. The ash makes a good fertilizer, and as the soil is loose and plowing with a stick is all they deem necessary a small amount of rice is planted and a very small crop is raised.

In a year or two the tall cogon grass begins to appear, and forces the man who will not even attempt to plow it out to move once more into the heavy timber and repeat the former operation.

The maps now on file in this office show in color a vast area of such land.

Should a person desire to purchase public land in a region where cañigins had been made he would be informed that a large part of such devastated land was private property and claimed by the persons above mentioned, although no taxes or other claim had ever before been made by them.

REGISTRATION OF PRIVATE WOODLANDS.

During the fiscal year titles to 20 private woodlands were registered in the bureau of forestry in accordance with section 24 of the forest act. The total area of the estates registered is 135,880.42 hectares, of which 68,222 represent the approximate area of woodland. Thirteen of the estates registered during this period are part of the estates belonging to what is known as the Friar lands, recently purchased by the Philippine government.

Up to the present time 169 estates with more or less woodland, and comprising a total area of 283,693 hectares, or approximately 700,000 acres, have been registered in this office.

FOREST MAPS.

The 10 forest districts of the archipelago are divided into plots of 10 kilometers square and each square given a number. Forest officers use as points of reference the places in the district that have been fixed by the coast and geodetic survey.

Each forester while traveling in his district makes constant use of a topographical notebook, compass, and barometer, and a reconnaissance sketch is made on each 10 by 10 kilometer sheet as he passes from square to square. At this time the limits of the forests are noted, as are also those of the cultivated and uncultivated lands, condition of roads, trails, streams, etc. The original

sheets thus plotted are sent to the Manila office. Copies are retained by each forester. The Filipino forest officers are being trained in this class of work and are making satisfactory progress.

More detailed surveys are made of special forest tracts by an assistant forester who is a competent topographical engineer. On these tracts careful forest studies are made by a field force consisting of one or more foresters, the rangers of the locality, and the necessary laborers.

These reports are prepared for the special use of prospective logging companies.

DIVISION OF FOREST PRODUCTS.

On July 25, 1906, the division of forest products was established. The object of the division is to investigate the amount, character, value, and uses of the Philippine forest products, and to bring this information to the notice of Philippine and foreign markets. As the records for the past years showed considerable partially classified information it was necessary to collect and systematize the same, and to prepare such part of it as was deemed advisable for publication. In accordance with this, the work of the division has been concentrated along the following lines:

- I. Preparation for the printer of data collected for publication.
- II. Classification and cataloging of reports on hand.
- III. Collection of museum samples of forest products.
- IV. Durability tests.
- V. Forest investigation.

I. Preparation for the printer of data collected for publication.

The following, issued in December, 1906, were prepared for publication:

Bulletin No. 4. I. Mechanical Tests, Properties, and Uses of Thirty Philippine Woods. II. Philippine Sawmills, Lumber Market, and Prices, by Rolland Gardner, Manager of the Timber Testing Laboratory.

Bulletin No. 5. Preliminary Working Plan for the Public Forest Tract of the Insular Lumber Company, Negros Occidental, P. I., by Foresters Everett and Whitford.

Bulletin No. 6. Preliminary Working Plan for the Public Forest Tract of the Mindoro Lumber and Logging Company, Bongabon, Mindoro, P. I., by Foresters Merritt and Whitford.

Circular No. 1. Opportunities for Lumbering in the Philippine Islands.

The following bulletin will be ready for publication in the near future: Preliminary Check List of the Principal Timber Trees in the Philippine Islands.

The following bulletins are in process of completion: The First Ten Timber Trees of the Philippine Islands; Some Philippine Forest Types and Their Commercial Possibilities; A Ranger's Primer of Forestry.

A second edition of Bulletin No. 4 has been prepared and sent to the director of printing.

II. Classification and cataloging of reports on hand.

The classification and cataloging of reports collected during the five years' existence of the bureau up to July 1, 1906, meant the personal inspection by the chief of the division of forest products of all information collected covering the subject of forest products up to that date. This information is filed and indexed.

III. Collection of museum samples of forest products.

LOG SPECIMENS.

With few exceptions, each wood specimen now in the museum consists of what can be designated as log specimens, with one or more hand specimens. The log specimens are divided into three sizes:

(a) Large specimens 3 feet in height and from 10 to 25 inches in diameter, cut to show bark and cross, radial, and bevel sections.

(b) Medium specimens 2 feet 4 inches in height and 6 to 12 inches in diameter, cut as above.

(c) Small specimens 9 to 18 inches in height, cut as above, or smaller ones cut in various sizes.

These specimens are to be arranged: First, according to sizes, those of each size according to group, and within the group according to scientific names. The arrangement by scientific names is preferable to the use of common names, because specimens of more than one common name would otherwise become separated. All specimens have labels giving information concerning their origin, herbarium, number, uses, value, and quantity available.

The object of the wood collection is to obtain eventually authentic specimens of all the timber trees of the islands, and to make them as useful as possible to those interested in the wood and lumber industries of the islands. The following is the present status of the wood collection: Total number of samples on hand, 3,235; total number of species represented, 336.

BEJUCOS.

The arrangement and numbering of the specimens of bejuco have been little disturbed. Catalogue cards have been made out containing such information as has been gathered concerning them. These cards have been inserted in the general catalogue and may be found under the common names of the bejuco desired.

Within the past year a number of commercial bejucos have been collected in fruit. As soon as the collection is sufficiently large, it will serve as a basis for structural study, the results of which will make it possible to classify more satisfactorily the commercial collection.

Bejucos with botanical specimens are given the regular herbarium number.

Bejuco buyers for the American market have examined the large line of specimens in the museum. Preferred species have been noted. Prices quoted have been added to other information on the label. There are a number of desirable furniture bejucos in the islands, and an endeavor will be made to find a market for them. At present the principal use of Philippine bejuco is for baling purposes.

OTHER MINOR FOREST PRODUCTS.

The minor forest products other than bejucos had already been given serial numbers, beginning with one. These numbers were retained. The whole collection was arranged in uniform boxes of three sizes. The exhibit was then arranged in groups under the following heads: Almaciga, Brea, Rubber (including gutta-percha), and Miscellaneous.

Each specimen has the number pasted on it, a display card, and a catalogue card. The latter may be found in the general index. Minor forest products, with botanical material, are given herbarium numbers.

IV. Durability tests.

With the issuance of Circular No. 7, dated October 24, 1906, there was inaugurated a system of labeling timber used in certain classes of construction. Arrangements have also been made with the bureau of public works, the bureau of posts, and the railway companies, to aid in this work. The object of these tests is to obtain more accurate information concerning the durability of Philippine timbers. Reports of tests with wood samples are given a special file.

V. Forest investigation.

During the fiscal year the following papers have been prepared that add materially to our knowledge concerning the Philippine forests and their products:

I. Report on examination of pine lands, Province of Benguet, Forester H. M. Curran. (See p. 155.)

II. A preliminary examination of the forests of the Kabibihan River basin, province of Tayabas, P. I., with map.^a Forester William H. Kobbe.

III. Report on forest conditions in the mining region of Aroroy, Masbate, P. I., with map.^a Foresters F. L. Pray and H. M. Whitford.

IV. An available forest tract in Negros Occidental, with map.^b Forester H. D. Everett. (See p. 153.)

V. Report on the forests of Danao, Cebu, and timbers used by the Insular Lumber Company, with map.^a Forester H. D. Everett.

^a Not received in the War Department for printing.

^b This map has not been received in the War Department.

VI. A progress report on the investigation of Philippine timbers. R. Gardner.^a (Included in second edition of Bulletin 4.)

VII. An available forest tract in northeastern Mindoro, with map.^a Forester M. L. Merritt. (See p. 154.)

The work of this division has been so satisfactory and its scope has so broadened that it has been decided to change its title to "Division of forest investigation."

TIMBER-TESTING LABORATORY.

The manager of the timber-testing laboratory resigned in February, having completed three years' service. He accepted a position with the Philippine Railway Company, receiving a substantial increase in salary.

During the year, 11 native timbers and 4 Japanese woods received a series of tests.

A large number of log and other smaller wood specimens were prepared in the laboratory for the museum of this bureau.

On December 4, the manager of the timber-testing laboratory was, at the request of the secretary of public instruction, sent to Bacolod, Iloilo, Dumaguete, Tagbilaran, and Lucena for the purpose of inspecting the timber being used in the construction of schoolhouses at those places. There was a dispute as to the classes of wood used in construction. The contractors offered to pay all expenses if this office would send a wood expert to make an examination and report. The examination and report showed that in certain places inferior woods not called for in the specifications and inferior grades of the woods called for were being used.

CEYLON RUBBER EXHIBITION.

A representative of the bureau was sent to attend the Ceylon Rubber Exhibition, held at Peradeniya, Ceylon, September 13-27, 1906. Specimens of Philippine rubber and gutta-percha and copies of all information with reference to this industry in the Philippine Islands were taken as exhibits. In his report he states: "The Philippine exhibit, which was distinctly different from any other shown, attracted considerable attention and favorable comment."

Valuable information was secured with reference to the best methods of planting rubber, when and how to tap rubber trees, the preparation of the rubber for commercial use, etc.

He also purchased for the museum of this bureau a set of the instruments used by rubber planters, samples of the best grade of rubber, and a set of interesting photographs, showing the various stages of the rubber industry.

ZAMBOANGA FAIR.

An exhibit of wood samples and minor forest products common to Moro Province was prepared and exhibited at the Zamboanga fair, held in Zamboanga, February 12-15, 1907.

EXHIBIT OF FOREST PRODUCTS SENT TO THE UNITED STATES.

An exhibit of 40 large wood samples, a set of minor forest products, and several sets of publications of the bureau were prepared and shipped to the Pacific Commercial Museum at San Francisco, Cal.

GEORGE P. AHERN,
Director of Forestry.

The SECRETARY OF THE INTERIOR,
Manila, P. I.

^a Not received in the War Department for printing.

APPENDIX.

LIST OF LICENSES, JULY 1, 1906, TO JUNE 30, 1907.

Province.	Timber.		Firewood.		Gratuitous.		Minor products.		Total.
	By bu-reau.	By sub-ordi-nates.	By bu-reau.	By sub-ordi-nates.	By bu-reau.	By sub-ordi-nates.	By bu-reau.	By sub-ordi-nates.	
Laguna.....	24		6	7			3	4	44
Rizal.....	15	1	10	22			3	5	56
Cavite.....	3		3	13				1	20
Bataan.....	49		5	31	2		2	17	106
Pampanga.....	13		1	5	2				21
Bulacan.....	20	2	1	3	2		4	10	42
Zambales.....	36		6	17	6		11	45	121
Tarlac.....	27	2	3	18	10			3	63
Pangasinan.....	42	26	1	31	2			15	117
Benguet.....	6	7	1		2		1		17
Nueva Ecija.....	31	12		8	3			13	67
Nueva Vizcaya.....	2	12			4	1			19
Ilocos Norte.....	13	38			3				54
Ilocos Sur.....	20	29		22	1		2	5	79
Lepanto-Bontoc.....	15	21			7				43
Union.....	10	7			1				18
Cagayan.....	36	3		9	1	38	1	23	111
Isabela.....	17				6			1	24
Tayabas.....	41	27		65	1			87	221
Camarines.....	25	3		32	3		1	54	118
Mindoro.....	44	7	1	43	1		3	50	149
Batangas.....	3			7					10
Romblon.....	11			3				8	22
Iloilo.....	13	4		33				24	74
Capiz.....	4	1	2	15				1	23
Antique.....	1							1	2
Negros Occidental.....	25	1		51	2			42	131
Negros Oriental.....	11	13		6	2			10	42
Cebu.....	10	5		3				5	23
Bohol.....	8			7					15
Leyte.....	13			12	1			7	33
Samar.....	3			5			1	4	13
Albay.....	20	2	4	5			9	4	40
Sorsogon.....	47	2	23	31	7		13	47	170
Moro.....	42	10		21	4		2	52	131
Misamis.....	6	1		1				3	11
Surigao.....	20			1	2		1	1	25
Palawan.....	24	1		8			1	14	48
Total.....	700	237	67	535	75	39	54	556	2,323

TIMBER LICENSES GRANTED IN FORMER FISCAL YEARS.

Year.	By bu-reau.	By sub-ordi-nates.
1906.....	1,053	216
1905.....	1,177	494
1904.....	1,027	304
1903.....	938	
1902.....	672	

REPORT OF THE UTILIZATION OF FOREST PRODUCTS FROM PUBLIC LANDS ON WHICH GOVERNMENT CHARGES HAVE BEEN COLLECTED FROM JULY 1, 1906, TO JUNE 30, 1907.

[Qq. m.=One metric quintal, or 220.46 pounds.]

Province.	Timber.			Minor products.						
	First group.	Lower groups.	Total.	Fire-wood.	Char-coal.	Tan-bark.	Dye bark.	Wood oils.	Rattan.	Gum mastie.
	Cu. m.	Cu. m.	Cu. m.	Cu. m.	Cu. m.	Qq. m.	Qq. m.	Liters.	Pieces.	Qq. m.
Albay.....	115	680	795	880					1,170,900	100
Ambos Cama- rines.....	212	2,027	2,239	5,351					11,692,074	308
Antique.....				146		9	40		39,000	
Bataan.....	21	12,539	12,560	32,241	899				3,732,417	
Batangas.....	23	19	42	955					137,890	
Benguet.....		995	995	3						
Bohol.....	142	511	653	194				12	38,000	
Bulacan.....	50	3,249	3,299	10,560	320	25			1,017,200	8
Cagayan.....	1,508	543	2,051	670		225			4,537,800	1
Capiz.....		44	44	7,844		83	117	612		
Cavite.....	2	174	176	3,137	88					
Cebu.....	100	392	492	2,632	390	113		1,098	529,550	
Ilocos Norte.....	113	45	158	317					6,490	
Ilocos Sur.....	258	749	1,007	8,695					177,350	
Iloilo.....	172	53	225	15,084	405	6			64,900	
Isabela.....	565	375	940	30					856	
Laguna.....	8	1,360	1,368	1,665					606,300	
Lepanto-Bontoc.....	10	6	16							
Leyte.....	156	1,059	1,215	5,158		497		1,123	2,676,380	
Mindoro.....	1,459	7,151	8,610	4,902	5	2,902	409		836,030	
Misamis.....	10	26	36	117					378,412	
Moro.....	608	1,964	2,572	3,209		2,622	1,033		1,685,500	4,334
Negros Occi- dental.....	123	5,995	6,078	7,446		676		4,811	2,605,500	16
Negros Oriental.....	94	20	114	6,454		69		5,283	1,776,100	2
Nueva Ecija.....	256	223	484	60		226			867,482	
Nueva Vizcaya.....	7		7							
Palawan.....	3,096	55	3,151	274		127			471,800	811
Pampanga.....	4	795	799	12,909	146					
Pangasinan.....	452	962	1,404	5,066	245	154	10		402,700	
Rizal.....	6	61	67	16,351					2,085,520	
Romblon.....	6	517	523			3				98
Samar.....	33	42	75	441		57		2	48,000	
Sorsogon.....	1,440	1,381	2,821	4,529	1	1,214	6		9,409,040	4
Surigao.....	84	79	163	437		70			284,150	
Tarlac.....	101	1,027	1,128	3,121	19	31			61,858	
Tayabas.....	2,928	4,896	7,784	14,429		219	287		1,029,740	543
Union.....	83	100	183							
Zambales.....	90	3,191	3,281	1,173	833				1,615,880	
Total.....	14,336	53,220	67,555	176,569	3,361	9,328	1,902	12,941	50,078,719	6,225

Gutta-percha and rubber.....	qq. m.	942
Dyewood, Province of Iloilo.....	qq. m.	33,841
Pltch.....	qq. m.	404
Gogo.....	qq. m.	181
Dillman (vine for fishtraps).....	pieces	125,160
Stone.....	pieces	642
Stone.....	avans	318
Earth.....	ollas	55

AMOUNT OF TIMBER TAKEN OUT BY LEADING LICENSEES DURING THE FISCAL YEAR 1906-7.

Licenses.	Location.	Amount cut.
		<i>Cubic meters.</i>
Insular Lumber Co.*.....	Cadiz Nuevo and Sagay, Negros Occidental.....	2,619
Mindoro Lumber and Logging Co.*.....	Pinamalayan, Mindoro.....	1,194
Reiss & Mitchell*.....	Pasacao, Camarines.....	443
Timber Cutters' Association of Unisan.....	Pitogo, Tayabas.....	1,255
John Gibson.....	Pinamalayan, Mindoro.....	1,181
Vicente Mijares.....	Dinalupijan.....	1,030
José Verchez.....	Calauag, Tayabas.....	924
Felix Labasan.....	Subic, Zambales.....	797
Ohas. A. Barber.....	Pinamalayan, Mindoro.....	768
Beebe, Lyon & Co.....	Zamboanga, Moro.....	761
Nicanor Añable.....	Subic, Zambales.....	695
Faustino Lichauco.....	Orion, Bataan.....	682
Compañía Maderera de Luzon.....	Guinayangan, Tayabas.....	642
Gelacio Linao.....	Moron, Bataan.....	632
Ang Katlagan.....	do.....	609
Ramon Murga.....	Puerto Princesa, Palawan.....	604
Astigarraga & Co.....	Camalaniugan, Cagayan.....	599
Juan Duran.....	Moron, Bataan.....	567
Marcelo Gutierrez.....	Bagac, Bataan.....	559
Paulo Gustilo.....	Manapla, Negros Occidental.....	544
Total.....		
	.....Cubic meters.....	17,103
	.....Board feet.....	5,130,900

* Twenty-year license agreement.

NOTE.—Five hundred cubic meters of Philippine timber as furnished the mills will approximate 150,000 feet B. M.

Only 5 other licensees have cut over 500 cubic meters. Timber licenses to the number of 997 were issued during the fiscal year.

IMPORTS OF LUMBER INTO THE PHILIPPINE ISLANDS DURING THE FISCAL YEAR 1906-7.

From—	Quantity.	Value, United States currency.
United States.....M feet, B. M.....	10,734	\$168,866
Other countries.....do.....	2,574	119,843

In addition 3,008 M feet B. M. of Oregon pine, free of duty, were imported by the quartermaster department, United States Army.

EXPORTS OF LUMBER FROM THE PHILIPPINE ISLANDS DURING THE FISCAL YEAR 1906-7.

To—	Quantity.	Value, United States currency.
United States.....M feet, B. M.....	181	\$3,630
Other countries.....do.....	71	1,406

Sappan wood (dyewood) to the value of \$51,695 United States currency were exported.

Cabinet ware and house furniture were exported to the United States to the value of \$910 United States currency, and to other countries to the value of \$1,908 United States currency.

APPLICATIONS FOR PERMITS TO MAKE CAINGINS, JULY 1, 1906, TO JUNE 30, 1907.

Province.	On public lands.			On private lands.		
	Granted.		Total.	Granted.		Total.
	By forest officers.	By municipal presidents.		By forest officers.	By municipal presidents.	
Albay.....	45	1	46			
Ambos Camarines.....	50	158	208	2	6	8
Antique.....	50		50	1	8	9
Bataan.....	175		175			
Bulacan.....	3		3			
Capiz.....	6		6		6	6
Ilocos Norte.....	7		7			
Ilocos Sur.....	161	124	285		1	1
Iloilo.....	8		8	1	1	2
Lepanto-Bontoc.....	31		31			
Leyte.....	15	1	16			
Mindoro.....	69		69	193	92	240
Moro.....	62	1	63	4	15	19
Negros Occidental.....	126	1	127			
Nueva Ecija.....	3	6	9	3	2	5
Palawan.....	20		20			
Pampanga.....	3		3			
Pangasinan.....						
Romblon.....	32		32	2		2
Sorsogon.....	12		12		17	17
Surigao.....	1		1			
Tayabas.....	175	7	182	46		46
Union.....		4	4		5	5
Zambales.....	3		3			
Total.....	1,057	303	1,350	207	153	360
Total 1905-6.....	657	464	1,121	121	71	192

APPLICATIONS FOR HOMESTEAD, PURCHASE, AND LEASE OF PUBLIC LANDS, JULY 1, 1906, TO JUNE 30, 1907.

[Certified as more valuable for agriculture or forest purposes.]

Province.	Homestead.			Purchase.			Grand total.
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	
Albay.....	6		6				6
Ambos Camarines.....	30		30				30
Antique.....	1	1	2				2
Bataan.....	18		18	4		4	22
Cagayan.....	10		10	1		1	11
Ilocos Norte.....	18		18				18
Ilocos Sur.....	15	1	16	3		3	19
Iloilo.....	19		19				19
Isabela.....	31	2	33	2		2	35
Laguna.....	2		2				2
Leyte.....	9		9				9
Mindoro.....	84	2	86				86
Moro.....				1		1	1
Negros Occidental.....	102	9	111				111
Negros Oriental.....	7	1	8	1		1	9
Nueva Ecija.....	160		160	1		1	161
Pampanga.....	9		9				9
Pangasinan.....	17		17				17
Rizal.....	10		10				10
Romblon.....	48		48				48
Sorsogon.....	41		41				41
Surigao.....	3		3				3
Tarlac.....	35		35	1		1	36
Tayabas.....	189	3	192	8		8	200
Union.....	4		4				4
Zambales.....	13		13				13
Total.....	881	19	900	23		23	923
During fiscal year 1905-6.....	318	16	334	20	1	21	355
Total, two fiscal years.....	1,199	35	1,234	43	1	44	1,278

Bataan..... }
Palawan..... } 1 lease each applied for..... }
Tayabas..... }
Moro, 9 leases applied for..... } Certified as more valuable for agriculture.

NOTE.—On June 30, 1907, there were 1,427 homestead, 22 sale, and 2 lease applications, pending report by forest officers.

REVENUE FROM THE SALE OF FOREST PRODUCTS.

Province.	Amount.	Province.	Amount.
Albay.....	P1,542.40	Mindoro.....	P2,681.29
Ambos Oamarines.....	6,475.68	Misamis.....	1,192.63
Antique.....	89.78	Moro.....	14,811.74
Bataan.....	4,152.56	Negros Occidental.....	4,218.65
Batangas.....	605.63	Negros Oriental.....	676.32
Benguet.....	942.55	Nueva Ecija.....	1,590.15
Bohol.....	431.15	Palawan.....	1,653.28
Bulacan.....	7,475.43	Pampanga.....	2,599.28
Cagayan.....	4,752.33	Pangasinan.....	5,703.70
Capiz.....	1,340.46	Rizal.....	2,252.43
Cavite.....	620.50	Romblon.....	217.49
Cebu.....	7,177.52	Samar.....	559.14
Ilocos Norte.....	1,528.46	Sorsogon.....	4,414.84
Ilocos Sur.....	3,428.27	Surigao.....	431.85
Iloilo.....	14,766.04	Tarlac.....	2,634.41
Isabela.....	2,344.29	Tayabas.....	6,871.72
Laguna.....	1,489.34	Union.....	1,067.91
Lepanto-Bontoc.....	81.50	Zambales.....	724.72
Leyte.....	4,516.78		
Manila.....	73,174.67	Total.....	191,080.49

EXPENDITURES BY THE BUREAU OF FORESTRY, JULY 1, 1906, TO JUNE 30, 1907.

FIELD FORCE.

Salaries and wages, forest officers.....	P58,987.66
Salaries and wages, map section.....	2,240.00
Labor hire and field parties.....	2,244.37
Per diems and travelling expenses.....	14,244.89
Postage and telegrams.....	386.74
Transportation and freight.....	1,368.01
Supplies.....	983.18
Office rents.....	434.00
Commuted leaves.....	3,934.00
Total.....	84,822.85

CLERICAL FORCE.

Salaries and wages.....	P10,651.83
Postage and telegrams.....	547.00
Labor hire.....	12.00
Transportation.....	223.46
Office supplies.....	370.14
Commuted leaves.....	3,389.60
Total.....	15,194.09

TIMBER-TESTING LABORATORY.

Salaries and wages (one assistant engineer).....	P1,718.89
Supplies.....	210.46
Wood samples.....	516.19
Commuted leave.....	825.10
Total.....	3,270.64

OTHER EXPENSES.

Printing and binding.....	P2,752.34
Repairs and miscellaneous expenses.....	964.44
Refunds.....	1,651.28
Total.....	5,368.06

RECAPITULATION.

Expenses, field force-----	₱84, 822. 85
Expenses, clerical force-----	15, 194. 00
Expenses, timber-testing laboratory-----	3, 270. 64
Miscellaneous-----	5, 368. 06
Total-----	108, 655. 64
The above includes expenditures for outstanding obligations pertaining to the fiscal year 1906, amounting to-----	3, 606. 09
Appropriation for 1907-----	100, 000. 00
Additional appropriation-----	5, 000. 00
Balance from fiscal year 1906-----	6, 853. 90
Total-----	111, 853. 90
Outstanding obligations fiscal year 1906, of which ₱1,353.50 reported as expenditures in last annual report, but actually paid during fiscal year 1907-----	4, 969. 59
Available for fiscal year 1907-----	106, 884. 31
Balance on hand June 30, 1907-----	1, 834. 76
Expenditures, fiscal year 1907-----	105, 049. 55

AN AVAILABLE FOREST TRACT IN OCCIDENTAL NEGROS.

[By H. D. EVERETT, Forester.]

There is in northern Negros a large tract of forest very suitable for a lumbering operation on a large scale. In respect to purity of stand and heaviness of yield, factors of great importance in a large operation, it is probable that this forest is not excelled in the Philippines. In almost all respects it is similar to the tract of the Insular Lumber Company, for which a working plan was made in 1906. For a detailed description of that tract see Bulletin No. 5, bureau of forestry, Manila, P. I., A Preliminary Working Plan for the Public Forest Tract of the Insular Lumber Company, Negros Occidental, P. I.

The tract adjoins that on which the Insular Lumber Company is now operating, and extends from the Talabon River, in Cadiz, through the municipalities of Manapla, Victorias, Saravia, and Silay, gradually moving farther back from the coast up the slopes of Mount Silay or Maripara (see map).^a The more accessible part, and that which would be suitable for present lumbering, is in the towns of Cadiz, Manapla, and Victorias.

The topography, as shown by the map, is characterized by low, broad ridges in the lower edge of the forest, which gradually become sharper and higher and separated by deep canyons as the mountain is ascended. The soil is a deep brownish yellowish clay, fairly suitable for agriculture.

The forest is characterized by a numerous dominant stand of six large trees, belonging to the family *Dipterocarpaceæ*, which are merchantable species. They are balabacan (*Shorea polysperma* Merr), red lauan (*Shorea* sp.), apitong (*Dipterocarpus grandiflorus* Blanco), almon (*Shorea squamata* Dyer), lauan dunlog (*Shorea contorta* Vid), and lauan bagtican (*Shorea* sp.). The wood of the first two is red and very similar, and that of the last three is commonly called white lauan. Beneath these large trees is an understory of many smaller species, some of which may become merchantable.

Of this forest there are 25 square miles available lying below 750 feet above the sea. This timber is accessible and can be logged profitably at the present time. In addition there are 15 square miles above 750 feet which can be logged later.

The accessible 25 square miles, or 160,000 acres, have an average of at least 30,000 feet B. M. of merchantable timber per acre, or a total supply of 480,000,000 feet B. M. This would supply a sawmill, cutting an average of 50,000 feet B. M. per day, for three hundred days each year for thirty-two years.

^a Not received in the War Department.

The most important factor affecting the exploitation of this forest is the transportation of the lumber to the market. The tract differs from that of the Insular Lumber Company in that it has no good navigable river which steamers and barges can readily enter. The Sicaba River, which is navigable nearly to the barrio of Caduhuan, has such a bad bar that its use as a harbor is practically out of the question.

The best and cheapest method of exploitation is clearly by means of railroads. The new railroad which the Philippine Railway Company has contracted to build in Negros as planned will pass approximately through the barrio of Caduhuan, parallel with the edge of the forest and a little more than 2 miles distant. A lumber company would find it advisable to build its sawmill on the Sicaba River, where the railroad crosses it, and build its own logging railroad into the forest. The sawed lumber could then be shipped to the Danao River, the northern terminus of the railroad, a distance of about 25 miles, or to Silay. Such an operation will require a large capital, but managed efficiently should prove profitable.

So similar are this tract and the adjoining one on which the Insular Lumber Company are now operating that the following extract, from Circular No. 1, bureau of forestry, applies equally to both, and gives a clear idea of the lumbering possibilities in this region:

"SUMMARY OF LUMBERING POSSIBILITIES ON ONE TRACT OF PUBLIC FOREST IN
NEGROS OCCIDENTAL.

"In Bulletin No. 5 of the bureau of forestry a description is given of the forests and lumbering operations near Cadiz, Negros Occidental. The summary of this bulletin is as follows:

"Area of tract, 69 square miles; area in forest, 37,668 acres.

"Stumpage charges on this tract are collected on manufactured lumber and average less than \$1.20 United States currency per thousand feet B. M.

"Six tree species constitute about 90 per cent of the total stand of merchantable timber on the entire tract.

"AMOUNT AND VALUE OF MERCHANTABLE TIMBER ON TRACT OVER 20 INCHES IN
DIAMETER.

Species.	Stumpage charge, M feet B. M. (approximate).	Feet B. M. per acre.	Total yield, M feet B. M.	Manila price, M feet B. M.	Value per acre.	Total value.
Apitong.....	P4	5,140	183,572	P90-P115	460	P17,421,480
Almon.....	2	7,150	269,269	70- 90	500	18,848,830
Balabacan.....	4	4,640	174,742	70- 90	825	12,231,940
Mangachapuy (Red Lauan).....	2	13,240	496,618	70- 90	925	34,903,260
Lauan-baglican and Lauan-dunlog.....	2	1,880	70,801	70- 90	130	4,956,070
Total.....		32,050	1,207,002		2,340	86,361,580

"P2 equals \$1 United States currency."

AN AVAILABLE FOREST TRACT IN NORTHEASTERN MINDORO.

[By Forester M. L. MERRITT.]

During the year a special study was made of the forests of northeastern Mindoro by the district forester. The area studied has a coast line of about 65 miles, and extends back 7 to 18 miles from the beach.

With the exception of a strip 2 to 5 miles wide along the coast the whole area is solidly wooded. While some of the forest is not of the best quality, several excellent stands occur. The best stand, 40 square miles in extent, lies southwest of Lake Naujan. This lake is a body of fresh water about 9 miles long and 5 miles wide, deep, and navigable throughout, with the exception of the western side, which is shallow and low near the beach. It is connected with the sea by a river 9 miles in length. This river is deep and navigable for its upper half throughout the year and for its lower half during the rainy and a portion of the dry seasons.

In this region rapid tree counts were made on more than 100 acres along representative strips 10 meters wide. An average of about 38 trees over 1 foot in diameter were found per acre. Of these trees 47½ per cent in numbers are of 4 species of *Dipterocarpus*: Alam (*Shorea squamata*), 27.7 per cent; lauan (*Shorea contorta*), 9.7 per cent; tangulle (*Shorea* sp.), 6.9 per cent, and apitong (*Dipterocarpus* sp.), 3.2 per cent. Of the trees over 2 feet in diameter more than 70 per cent are of these 4 species. This will yield, after making an allowance of 25 per cent for defects, about 20,000 feet B. M. per acre. In making this estimate account is taken only of trees over 60 centimeters (2 feet) in diameter of the 4 above-mentioned species. The entire area of 40 square miles of this forest, according to this estimate, contains 512,000,000 feet B. M.

In addition to this yield there are scattering trees of a few other commercial species.

The country thus forested is made up of clay hills rising from the lake shore to an elevation of about 800 feet at a distance of 4 miles inland. Ridges, slightly broken in a few places, run back into this area and afford direct access to about half of this timber. Some difficulty would be found in reaching the rest, owing to the cuts and gullies in the soft clay hills, but in few, if in any, places will this preclude logging operations.

In addition to this area southwest of the lake, fair forests border the east and north sides, which would furnish malugay (*Pometia pinnata*), narra (*Pterocarpus indicus*), and other merchantable trees.

Logs may be rafted across the lake and down the river to the sea, which is within fourteen hours by steamer from Manila. Or, should it be desirable to avoid rafting over the lower half of this river, which is shallow during the dry season, and if it is also desired to avoid the danger and uncertainty of loading upon an open beach, a logging railroad could be constructed without much cost to the pier at Calapan, distant about 13 miles, where loading would be comparatively easy.

The following table shows prices and commercial names of timber tributary to Lake Naujan.

Commercial name.	Price.
Almon (Alam)..... M B. M.	₱70 to ₱90
White Lauan..... do...	70 to 90
Tangulle or Balabacan..... do...	95 to 120
Apitong..... do...	85 to 100
Malugay..... do...	95 to 130
Narra..... do...	225 to 300
Baticulm..... do...	200 to 250
Amuguis..... do...	110 to 150

In addition to this excellent forest, which has remained almost untouched because of its distance from market, a stand of at least 14,000 feet B. M. per acre is found, covering about 25 square miles in the vicinity of Balete, farther down the coast to the east and close to the forest above mentioned.

REPORT OF AN EXAMINATION OF PINE LANDS, TRIBUTARY TO BAGUIO, PROVINCE OF BENGUET.

[By H. M. CURRAN, Forester.]

The object of this examination was to determine the amount of timber near Baguio; to locate bodies of timber suitable for commercial exploitation; to make a detailed examination of one such tract, and to outline a plan for the protection of the region from forest fires. As a result of this examination sketch maps of Baguio and vicinity have been prepared, showing roughly the forest, cultivated, and grass areas.

Four tracts of commercial forests were located, covering a total area of 3,556 acres.

The principal tree of this region is pine (*P. insularis*), and occurs in practically pure stands. This pine closely resembles western yellow pine (*P. ponderosa*). The region occupied by this tree is broken and hilly, and the prominent features of its topography are long, narrow, connecting ridges, with many short lateral spurs. The crests of the ridges are 200 to 500 feet above the water courses. The slopes are steep, and those of 30 to 40 degrees are not uncommon.

The whole region has been constantly swept by grass fires, and the resulting stand is thin and open. The trees are short boled and knotty, excepting where small patches have been protected from fire by the topography. Here the trees are often straight, clear boled, with gradually tapering stems and small crowns. Coarse grasses and ferns cover the ground over the greater part of the area. Patches of reproduction are found where fires have been less frequent and severe.

The trees apparently bear large crops of fertile seed each year, and but for the fires an excellent reproduction, like that of loblolly pine (*P. taeda*), would be present over the whole area. The tree is a rapid grower, nodes 1 to 2 feet long are noted, and the rings of growth are often very wide. Merchantable timber can probably be grown in thirty to forty years from seed. A sample tree in a dense, even-aged stand on a favorable site had a diameter of 14 inches at breast height and showed 40 periods of growth. Its clear length was 60 feet. The live crown began at 74 feet and the total height of the tree was 108 feet.

A detailed examination of 963 acres of commercial forest was made. All the trees on 70 acres were measured and taper analyses made of 20 felled trees. The result of these measurements is as follows:

Average number of trees per acre over 10 inches diameter breast high	13
Average diameter	21
Average board contents, 21-inch tree	550
Average stand per acre	7, 150
Approximately 32 per cent of the stand was marked for cutting, giving an average cut per acre of, approximately	2, 300
On this basis, the cut for the 963 acres of forest examined would be	2, 224, 800
And for the entire region of 3,556 acres	8, 178, 800

APPENDIX D.

REPORT OF THE DIRECTOR, BUREAU OF SCIENCE.

DEPARTMENT OF THE INTERIOR,
BUREAU OF SCIENCE,
Manila, P. I., August 5, 1907.

SIR: The following report, gives an account of the work performed in the bureau of science for the period from August 1, 1906, to August 1, 1907, together with such recommendations as to future improvements as seemed to me to be necessary.

THE ETHNOLOGICAL MUSEUM.

The ethnological survey, which was formerly a bureau and was transferred as a division to the bureau of education on November 1, 1905, was placed in charge of this bureau one year thereafter. This division up to the present time has been confined to temporary and inadequate quarters; first in the district of Malate, subsequently in the general government building on Plaza Binondo, afterwards in the bureau of education. It has never had a place for the proper care and display of its materials, and therefore deterioration, breakage, and loss was the inevitable result. During the present year, sufficient funds have been available in the appropriation for this bureau to alter and repair the quarters formerly occupied by the bureau of architecture and to place them in a fit condition to receive the ethnological museum. The transfer of this building of this bureau was brought about after considerable delay and the adjustment of the appropriation was also accomplished late in the fiscal year, so that we are only now in the position to begin to move the collection. Show cases in addition to those already on hand have been built, racks to hold weapons, shields, etc., placed on the walls, shelving put in to accommodate specimens, and the entire space renovated and put in condition for a public museum. It is proposed to have this museum open to the public during certain hours of the day, and it is hoped that the migrations of the division of ethnology are now at an end.

About one-fourth of the floor space available has not been utilized at present. It is obvious that room must be left for expansion of the ethnological museum and for other purposes. It is not deemed advisable to place the working collections of the bureau of science, such as the botanical herbarium, the ornithological, geological, and other collections in this building for many fundamental reasons. Some of these are: The distance from the central scientific bureau, which would operate especially to the detriment of both the botanical work and the investigations carried on in the bureau of science building which need the assistance of the botanists; the journey to and from the library is also one of the considerations and this is even a more serious matter. Much of the future work in botany will need laboratory facilities for the study of the histology of Philippine woods and of plant physiology and pathology, and none of the facilities for such investigations will be available in the new building. Therefore, it seems fundamentally necessary to provide room on Calle Herran for that class of work in the Bureau of Science which depends upon scientific collections.

THE NEED OF A COMMERCIAL MUSEUM.

In the past few years this bureau has from time to time collected many specimens and prepared many products of commercial value in the development of the islands; all of this material has been sent to various collections, exhibitions, and museums in the United States and none reserved here, so that the islands are confronted with the fact that, whereas we are in every way

endeavoring to enhance the availability and volume of our natural resources, we have nowhere in Manila a place where strangers visiting the islands can go to view specimens of the natural products and to obtain the commercial information which is necessary for their intelligent understanding. Such a place should be in connection with the ethnological museum, which is already established. However, a commercial museum would be of little value were it not provided with a good division of information, a thoroughly competent man at its head, and sufficient clerical assistance to collate and supply all details necessary to assist visitors in Manila. A classified and catalogued card system, which would give all available information regarding the natural products, so collated that every detail available to the Government and to private persons would be collected in this central spot, would be of the greatest assistance in advancing the interests of the islands. The subject of Philippine coals furnishes an example. There should be a place where a visitor could ascertain at once and with the greatest facility the results of all analyses which have been made on Philippine coals, the percentage of efficiency resulting from boiler tests, the location of the coal beds, the means of transportation to and from their location, the expenses of labor in the various districts, the wharfage facilities, and so forth. Again, if, for example, a stranger were interested in a product from some of the unexploited oil seeds or nuts found in the islands, information as to the availability of these seeds, the opportunities for collecting, the percentage and the quality of the oil, and all other data regarding them should be available in such a division of the government. The various grades of manilla hemp and the methods of reaching a classification should be on file, and in each instance museum specimens should accompany the records. The above are only a few examples which come to mind owing to past experience, and new questions are constantly arising.

The system to be inaugurated would need to be thoroughly organized with means of obtaining very accurate and complete information, otherwise the project should not be undertaken. One essential feature should be a complete collection of catalogues and price lists. The market values of all local and foreign commodities which may be a factor in the development of the islands should be available, as under present conditions it is sometimes necessary for the visitor to call upon a number of bureaus to obtain his information section by section, with the possible necessity of making a long journey through the provinces in order to obtain even a preliminary view of the field.

Much information which could really be made available is not now gathered for the reason that there is no uniform system, and each bureau of the government is simply obtaining such data as it deems necessary for its own work. Such offices as the bureau of education and the constabulary could be utilized for systematically furnishing details from the provinces in regard to products, routes, or maps, and the mere fact that the attention of teachers and constabulary officers is being called to the desirability of such facts and the existence of a central office for their proper handling will do much to stimulate activity in the line of gathering information.

AN ADDITION TO THE MAIN LABORATORY BUILDING.

In the past annual reports attention has been called to the overcrowded condition of the building of the bureau of science. The inauguration of the new medical school, and the necessity not only of providing space in this building for the advanced work of the faculty, but also of taking in a number of advanced students who need better facilities than can be afforded in the medical school, renders the necessity for increased space in the building of the bureau of science more and more apparent. The botanical, pathological, mineralogical, geological, and ichthyological collections are growing rapidly and the space available each year becomes proportionately less. The subject was so strongly urged before the Commission that authority has finally been granted to have plans drawn for a wing approximately 110 feet long and 50 feet wide. This addition would provide for the herbarium, the work in entomology, the collection of natural history specimens, the division of mines, and the new undertaking in the study of fish and fisheries. It is essential to the unity of the work and to the plan of a central scientific institution that the working collections, together with the staff connected with them, should not be separated from the main structure. The need of intimate intercommunication has developed more and more as the age of the bureau increases, and the vigorous carrying on of new

work is only possible under the stimulus of proper surroundings. Future plans should also contemplate the union of the ethnological and commercial museums under the same roof as the working collections of the Bureau and connected with the present building.

THE NEW WORK IN FISH AND FISHERIES.

We have during the past year, in addition to the amalgamation of the ethnological survey with the bureau of science, added work in fish and fisheries. This has begun in a modest way by engaging the services of Mr. Alvin Seale, who has a large experience in the identification of tropical and especially Philippine fishes. Authority has also been obtained for a voyage of the United States Fish Commission vessel *Albatross* to the islands for the purpose of exploration and investigation, the Philippine government furnishing the necessary coal during her stay in these waters. It is obvious that, while this government will obtain many advantages from this exploratory expedition, full and permanent results will not be available until we make up our minds to continue the division of fisheries as a permanent institution with equipment and facilities of its own. It is very certain, owing to the fact that the Philippine government will provide the coal for the *Albatross*, that it will be entitled to complete duplicate sets of the collections to be made, and also to a prompt report on the best means to be taken to increase the commercial availability of the marine fauna, but this is not all. It should be in a position to secure advanced advice and results before the appearance of the probably extended discussion which will be printed in Washington. I hope that during the visit of this vessel to our waters plans may be begun and funds become available for establishing the system of floating scows which I have advocated in the past. The division of fisheries is certainly of great importance when we consider the food value of the marine fauna to the people, and it should be continued with adequate facilities, aquaria, and personnel after the first exploratory work is over. One feature which I have dwelt on in the past, which I still consider to be not only advisable but almost necessary in this work, is the establishment of a public aquarium for the use of the people of the islands.

THE PHILIPPINE MEDICAL SCHOOL.

The director of the bureau of science was appointed dean of the school in December, 1906, and as so much of the work of the new institution is connected with that of the bureau of science, an account of the progress of the school is included in this report.

The Philippine medical school was brought to a working basis during the past year and it opened its doors to pupils on June 10, 1907, the total number of admissions being 54. The Commission appropriated sufficient funds to establish four years of the course at the present time, for although the board of control and the faculty decided that a five years' course was necessary in the Philippine Islands, it was obvious that no students would immediately be available for the fifth year. The object of the school is as rapidly as possible to train Filipinos as physicians, but with the conditions which confront us it does not seem feasible to allow the students to graduate with less than a five years' course of study. However, it appeared necessary, in order to give an opportunity for many applicants who had not been trained in the government schools, for the present to be somewhat lenient in the entrance examinations, the standard to be gradually raised as a larger number of the Philippine population becomes familiar with our methods of preliminary study and with the English language. It was also deemed essential to admit as advanced students a number of applicants who had previously studied medicine in other schools. While they have not the preliminary training which we will require of our own initial classes, nevertheless, by such admissions we will be giving an opportunity for many to take laboratory work and to become familiar with laboratory methods of instruction who otherwise might not have been able to gain these advantages. The students in question will undoubtedly be more or less weak in the initial work, but they nevertheless will be available for sanitary work in the islands much sooner than if we were compelled to wait for the first freshman class to graduate. They have been admitted as special students and will only be considered candidates for a degree if after one year of study they prove themselves to be fit to continue the work.

As soon as the doors of the school were opened one great necessity at once became apparent, and that was increased clinical facilities. The material at

St. Paul's Hospital is practically all that is available. The Civil Hospital is a pay institution, and at such a distance from the medical school that the loss of time in journeying to and fro is prohibitive. This lack of clinical material emphasizes even more strongly the fact that the Philippine Islands need and must have a well-equipped general hospital, with a minimum of 350 beds for the first year. Indeed, for a city of the population of Manila, with its many nearby suburbs, an institution of 1,600 beds would ultimately not be unreasonable. The necessities of medical instruction will then inevitably lead to the conclusion that the faculty of the school must also comprise the staff of the hospital, and such being the case it would seem more advisable to have the hospital under the immediate direction of the board of control of the medical school than to place it under any one bureau.

It seems evident, to judge from the results of the first year, that we must expect larger and larger entering classes as time goes on, and the temporary quarters of the school will soon be inadequate. An appropriation of ₱250,000 has been made for the construction of a new building which is to be in close proximity to the present laboratories of the bureau of science.

The advantages of the medical school will be felt not only in the training of pupils and in the general intellectual advance of the people, but also in the fact that its establishment will be another step toward making Manila the medical center of the Orient. Already we have called to the school an anatomist and a pathologist, who are thoroughly trained in their respective lines, and we hope within the next year to be able to call to the faculty a physiologist and a pharmacologist.

The gradual rounding off of the medical school is, therefore, begun, and no one who realizes the reputation which in the past the Philippines enjoyed from a sanitary standpoint, and who compares this reputation with the real facts as they exist to-day, will hesitate to say that the future advance in medical education, with the forming of a thoroughly competent medical faculty and hospital staff, will be one of the greatest factors in promoting the interests of the islands.

The bureau of science has been especially affected by the opening of the medical school, because six of its members are more or less actively engaged in teaching. The pressure on this bureau in this respect has been far greater than that on any other; in fact up to the present time no other bureau has been in a position to give any great amount of assistance. This condition of affairs is obviously one which necessitates extra work and makes it necessary to keep the biological staff of the Bureau at a maximum at all times.

A GRADED SALARY LIST IN THE BUREAU OF SCIENCE.

The appropriation for the present year will enable the bureau gradually to introduce a graded salary list in all divisions, and thus it will be able to offer greater inducements for men to come to the islands to take up scientific work and to remain in the service. While it is true that no changes have been made in the lower salaried positions, nevertheless the plan of grades will be such that members of the scientific staff will have a steady opportunity for promotion as resignations occur in the places above them, until they reach the highest positions. The differences between the salaries have been so adjusted as to apply equally to all divisions of the scientific work, and in the future it will be the fixed policy of the institution to allow no changes in salary for the benefit of the individual, but to improve the condition of the members of the staff by regular, graded promotions. Such opportunities should form a great inducement for prospective candidates to enter the service of this bureau, as before they are admitted they will have before them a clear and permanent schedule of the places above them and a definite knowledge of what they may expect.

However, advancement to the upper positions will only be possible to those in the lower ones who have shown themselves capable of independent endeavor and investigation. If such promotions were to be made simply because of length of service, the ultimate condition of the laboratory would be to have all of the higher positions filled by persons incapable of advancing the work of their respective divisions and not fitted to direct the research or the scientific work of those below them. Such a condition would involve the stagnation and ultimate dissolution of the laboratories.

The keeping in a subordinate position of a man who has not shown himself capable of advancing his work to the higher plane of investigation and direc-

tion, will, of course, be a situation which will bring its difficulties upon the director, as ultimately he alone will have to give the decision and run counter to the hopes of a number of employees who may be doing faithful and conscientious work, but a rigid application of the policy of reserving the higher places only for those who are capable of following advanced and independent research is so obvious that the situation will have to be faced in each individual instance and action taken accordingly. Such a condition must confront everyone who has charge of an institution in which a large part of the work is that of scientific investigation, and no mechanical method of promotion can be devised which will give the efficiency necessary for the maintenance of this bureau on the high plane which it has assumed in the past. This condition must be thoroughly understood by prospective candidates before they enter the service, so that if they are not capable of the work of the investigator they need not unduly expect promotion to the upper grades. It may follow from this that in the future it will not infrequently happen that calls to the bureau will be made directly to the higher salaried positions.

In the plan of the appropriation it was taken into account that the adjustment of salaries and promotions in the scientific force would not, excepting in special instances, be made sooner than one year after the previous promotion had taken place, and if this policy is carried out the bureau can meet its salary obligations on the new basis. It will be true that the next following year, if it should chance that all places available on this basis would be filled, the present appropriation, would be insufficient. This must be taken into account before the end of the present fiscal year. However, it has invariably been true in this bureau, as in others, that all positions are not occupied at one time, and it is also true that toward the end of a given fiscal year a number of employees usually take their vacation and have their leaves commuted. Such commutation obviously relieves the next fiscal year. The exact sum necessary to meet all the salaries as they have been authorized can therefore not definitely be stated at present. A very few future alterations in the salary list can advantageously be carried out when the time comes, by the consolidation of two or more lower paid positions into one higher one. Under these conditions we may look forward to a gradually increased usefulness in furthering the interests of the Islands.

The attention of the bureau in the past few months, and probably for a few months to come, has necessarily been distracted by the beginning of the new medical school and by the plans for organization and buildings, both old and new, which it has been necessary to consider. It is probably a conservative estimate that the results of the present plan of organization will not begin to be felt until six months have elapsed, when it is hoped that all changes will have been made and the institutions with which we are connected will be on a permanent working basis.

ROUTINE WORK.

Routine analyses and examinations of the kind we have been accustomed to in the past have recently diminished. This diminution is owing to the fact that the custom-house has gradually had many of the questions adjusted which needed laboratory advice, that the bureau of agriculture has not continued its policy of extensive soil analyses, that the bureau of health and other bureaus have also in the past few years of experience gradually advanced themselves to a condition where fewer analyses are necessary. In the biological laboratory we shall as a result have an increased opportunity for the careful study of tropical diseases, whereas in the past much time has been taken by the wholesale routine examinations which could not thoroughly be considered and digested, an example of such being the examination of rats for plague. It is therefore hoped that the next years will bring more permanent results in the understanding of our hygienic conditions. An advance is already being made in the study of animal parasites which affect a large number of prisoners at Billibid, and which are believed to be a serious factor in the present mortality among the people of the islands. While such parasites may not be the immediate cause of death, nevertheless, in weakening the condition of the populace they do give opportunity for the more ready attack of the people by other serious diseases. A further discussion of these questions will be made under the heading of the biological laboratory.

The decrease in the custom-house and other routine analyses in the chemical laboratory has been more than offset by the work of standardizing weights and

measures, which at times has been very heavy and exacting, and by the greater number of determinations we have made for private persons and firms, and as soon as we are able to make feasible the operation of act No. 1655, which has as a short title The Pure Food and Drugs Act, we shall within the next few months, have coming daily to the laboratory a large number of analyses, so that the routine work for the next year in this branch of the service will presumably show a very large increase.

One matter which should be brought to the attention of the various bureaus is that the chemical laboratory is in a position to examine and test materials purchased in large lots. It has always been a matter of surprise to me that organizations such as the bureaus of supply, of public works, and others, which deal in contracts for paints, oils, varnishes, alcohol, steel, and iron, have not systematically subjected their contractors to rigid laboratory examinations as to the quality of their goods. Samples of all articles of the above and other classes which are purchased for the government unquestionably should be submitted to the laboratory as a regular routine performance. The results would save the government loss in the purchase of inferior articles and would assist in every way in the saving of money. The laboratories have been organized with this as one of the ends in view, and advantage has not been taken of the chemical laboratory for the examination of materials to as great an extent as should be the case. It is also suggested that many instances might arise where officials of the government other than those connected with bureaus could very well refer matters of scientific importance to the laboratories as a preliminary to further consideration.

A CEMENT-TESTING LABORATORY.

The testing of cement is at present undertaken in several divisions of the government, and probably, as a cement-testing apparatus is not very expensive, and the whole time of one man in each division is not necessary, the distribution of this class of laboratory work among several branches of the government is not a detriment as regards expense. Nevertheless, attention should be called to the fact that if all of this work were to be carried on in the central laboratory, it would be of so great a volume as practically to occupy the time of one man with one or two assistants, and consequently a probable reduction of cost would be apparent. A greater additional advantage is found in the fact that the person making the tests would be a man thoroughly trained for this purpose, who would ultimately have a very extended experience with all of the classes of cement imported into the islands, and so a central place would exist where all knowledge as to the standard and quality of these materials would be concentrated. Such a procedure would also assist the laboratories in working out the problem of the development of the native cement industry. Therefore, for many reasons it would seem advisable to have all work on cement testing done in one institution.

MAP WORK.

The bureau of science, as has been the case with other bureaus and divisions of the government, has been much hampered by the confusion and contradictions which are found in the existing maps of the islands. Good maps are very useful for our collectors, and topographical maps are necessary for the division of mines. It is to be hoped that during the present year some steps may be taken toward uniting the results of all map work being carried on under the government and thus establish a progress map of the islands. A beginning in this direction is already planned. A complete topographic map of the islands, even with large contours, would be very expensive, and the cost could scarcely be met by this government, but it is perhaps possible that these surveys which are so fundamental to work in the islands may at some time be undertaken from funds appropriated by the Congress of the United States, and by officials of the Geological Survey. If money were ever to be appropriated for this purpose it is certain that we in the Philippines who are interested in the matter would give all the assistance in our power.

STOCK HELD BY THE PURCHASING AGENT.

One change which threatens seriously to hamper our work is the reduction in stocks held by the purchasing agent. We have been accustomed to hold in reserve many chemicals and pieces of apparatus, for which the bureau has not suf-

ficient storage room. Some of these materials may not be needed for two or three years, but no one can predict just what work we will be called to do during any given year. To purchase materials from abroad takes from six to nine months, and in the case of the common acids, supplies accurately calculated to last one year may be thrown overboard in transit, as has frequently happened. When a laboratory needs a certain thing it needs it badly, and the work must be suspended until it arrives. For these reasons, in the case of the bureau of science at least, it would be advisable to allow the purchasing agent to carry more than one year's supply.

THE LIBRARY.

The past year, as a whole, has been one of the most satisfactory in the history of the library. More has been accomplished than in the preceding one, although the work of systematic organization has only been begun. Nevertheless, many details which referred to old bills and vouchers have been settled after numerous discouragements, and they will not again delay the work. The accessioning of the large number of volumes which came into the library in the early history of the bureau, at a time when vouchers were not so clearly prepared and when large masses of books were brought in at a time, has been completed.

RENEWAL OF OLD ORDERS.

The old orders for books, which were outstanding had not been filled and apparently were not being filled by the book dealers with whom they were placed, were canceled and replaced in the fiscal year 1907 by new orders for 458 titles. The result has been most satisfactory, so that with the exception of requisitions for books made during the year 1907 there now remain only 56 of the above titles any part of which still are undelivered, and a number of partial deliveries of these have been made. The undelivered portions consist of books out of print, of parts of sets of periodicals, and of the publications of learned societies which are difficult to obtain in the book trade, and which can only be secured as libraries and collections of books are offered for sale from time to time.^a

NUMBER OF VOLUMES AND USE OF THE LIBRARY.

We are not yet in a position to give the exact number of volumes in the library, as the accession books have not yet been completed, owing to the lack of clerical assistance, but it is probably a conservative estimate to place it at 25,000 volumes, exclusive of about 600 maps and of trade catalogues, which alone amount to more than 2,000. When the accession records are completed to June 1, 1906, and an inventory made from that date, we shall be able to give an exact statement of any losses which may have occurred, but only two books and six pamphlets have been reported as missing in the work up to June 30, 1904, and there is still a possibility that one or two of these may be found.

All of the titles which have been accessioned, including the pamphlets to June 30, 1904, have had book numbers assigned to them and shelf list and main author cards made, but in about 10 per cent of the titles the class number has not yet been determined, and consequently the cards are not yet ready for filing and use. No subject or title cards have been made for the entire series, but the work has been well begun.

The necessity of an assistant librarian has become so apparent since we have seriously pushed the work of accessioning and cataloguing that the Commission authorized the position in the present appropriation bill, and steps will be taken to secure this employee at as early a date as possible.

Although this library is intended primarily for reference, the record of borrowers' cards for the year since the last annual report shows 3,848 titles taken out by 147 persons, this being in addition to the books taken out by various bureaus upon memorandum receipt, and reports from the latter also show a considerable circulation. It is certain that with the establishment of the medical school the circulation of the library will gradually increase during the pres-

^a Of the sets completed during the year, a complete list can be obtained at the Insular Bureau, War Department.

ent year; it is already true that a number of the students are in the reading room daily working at the literature of the subjects with which they are occupied.

Fifteen hundred volumes have been forwarded to the printer for binding during the past year. We have also received the initial shipment of the printed cards of the Library of Congress, a partial set of which, including all scientific titles, was sent to this library without expense, the only requirement being that the cards should be filed and available for consultation. The proof sheets of all the cards printed by the Library of Congress are received regularly, and all those desired are checked and ordered by serial numbers. This list should be of great assistance in bibliographical work.

It is certain that better service can be given at the loan desk with more assistance. The increasing use of publications taken outside of the building makes it important that this work should be attended to carefully and systematically. This is especially true because the library is so situated that it can not be locked, so that all possible protection must be given to guard against the loss of books. It would seem unfortunate to place doors and locks on the library, as it is so frequently used by responsible persons outside of the hours kept by the bureau, but if our accessioning should at any time reveal any considerable losses we shall probably have to install iron gates.

MISSING NUMBERS OF PUBLICATIONS.

The greatest single piece of work undertaken during the year has been an effort to fill in the missing numbers of publications wherever it is necessary to complete volumes which need to be bound. This involves not only completing sets from the date of their publication, but also the purchase of individual numbers. Many titles have been transferred to this library from time to time which contain incomplete volumes. Missing numbers were ordered for such volumes of these as the bureau making the transfer desired to have completed and bound. A very serious question in the Philippines is the number of losses in the mails affecting our regular receipts, both of subscriptions and exchanges. In some instances where journals have not come in the mail we have waited for from one to three years to secure the missing parts from the publishers, or through exchanges, but without success. Eventually we have been compelled to order several thousand single numbers to fill the various needs, requisitions for 123 titles, including from 1 to 135 numbers each, being placed at one time. The making up of these orders requires careful and painstaking work to avoid duplicating numbers on hand, or obtaining something not wanted by the scientific workers, or reordering before there has been time to hear from the latest previous request, or failing to specify indexes and title-pages where needed, etc. Probably not more than 25 per cent of these orders have been filled up to the present time, and it is more than likely that we shall have to do much more work and in some instances wait for years before these volumes are all completed.

During the present year we have done much to add to our stock of United States Government publications. We have received several hundred missing numbers from the Departments of Agriculture and of Commerce and Labor, the Geological Survey, and the various divisions of the Smithsonian Institution, and in one or two cases our sets have been completed with the exception of a very few numbers. A member of the staff is now on leave in the United States, and he will make a personal effort to secure more of the missing numbers while he is in Washington. A list has also been submitted to the document division of the executive bureau, Manila, and it is hoped that some numbers may be secured from this source.

EXCHANGES AND THE JOURNAL OF SCIENCE.

A large number of the publications of foreign governments has been received during the year, and among these the reports on fish and fisheries are of especial importance. Exchange relations have been extended in many cases to include old numbers as well as current issues, and much of value has been added to the library in this way. Actual exchanges for the issues of the Philippine Journal of Science now number 315, and many of the publishers have either sent or expressed their willingness to forward to us their earlier volumes in return for the previous publications of the various divisions of the bureau of science.

The Library of Congress also sends to us regular issues of "want" and "offer" lists, which we have already taken advantage of. It no doubt will often

be possible in this way to secure missing numbers not available elsewhere. We are making up a complete list of our duplicates and wants, and in time hope to enter into exchange relations with many libraries and institutions.

The library, in addition to regulating the exchanges for the Philippine Journal of Science, has maintained general supervision over the mailing of all copies of the Journal not forwarded from the bureau of printing. This includes copies sent to the various other publications for review, samples for advertising purposes, numbers furnished to subscribers through our various agencies, until the money is received by the bureau of printing, and the forwarding and keeping of the records of advertising matter concerning the Journal. A record of the disposal of all previous publications from all divisions of the bureau of science has also been kept. We have been able to reduce the detailed work on the Journal during the past three months by completing a printed mailing list, so that now the business office takes care of the transfers and the supervision of the mailing of the Journal of Science.

THE DIVISION OF BIOLOGY.

Only a few changes in the personnel of the biological laboratory took place during the past year. Dr. Philip H. Garrison, detailed from the Navy, reached here on January 10 to take the position of medical zoologist of the bureau of science, and since that time his work has advanced rapidly in the study of parasitic diseases infecting the prisoners in Bilbid. A statistical paper on uncinariasis and the proportion of prisoners affected will appear in the near future. Other work, including the investigation of the life history of parasites and the identifications of new species is necessary and will take some time, but certainly good results may be expected. Doctor Garrison has also begun a helminthological collection in the pathological museum, so that in the future we may have a complete record of all the parasites we have encountered, as well as material for exchange with other museums. Eventually this procedure will enable us accurately to identify many of the parasites of the Philippines and of other countries.

The position of clinical laboratory assistant, so long vacant, was finally filled by the arrival of Doctor Bowman.

PLAGUE VACCINATION.

The chief of the biological laboratory, Doctor Strong, on July 2 left on vacation for Europe and the United States. Before going he completed a long and painstaking work on the plague organism and the most advisable method of inoculation against plague. The extensive results, which involved experimentation with many small animals, appeared in the third number of the medical section, section B, of the Philippine Journal of Science, of this year. The work will certainly be authoritative on the subject of plague inoculation, and it is hoped that the method based upon the use of attenuated organisms will be given a rigid and extensive trial in countries where plague is unusually prevalent, and if such trial is given the laboratory has every confidence in the results. Doctor Strong will work in various foreign laboratories during his leave, and therefore will be partly carrying out the policy which has been the ideal one for the bureau since its inauguration, namely, to have every scientific worker given an opportunity to visit the laboratories of other countries once in a certain period of years. In the instance of Doctor Strong this has been done by not utilizing his leave for the past four years, but it would seem desirable in an institution of this kind to have an arrangement by which each employee who would need the benefit of foreign study would have one year in five on full salary for this purpose.

PUBLICATIONS AND INVESTIGATIONS OF THE BIOLOGICAL LABORATORY.

The work of the biological laboratory has appeared in eight papers during the year, all of which have been issued in the Philippine Journal of Science. The titles are as follows: Studies in Beriberi, by Maximilian Herzog; The Cultivation and Pathogenesis of Amoebae, by W. E. Musgrave and Moses T. Clegg; The Types of Bacilli of the Dysentery Group, by Y. K. Ohno; The Toxic Action of Saponin, by Harry T. Marshall; Agenesis of the Vermiform Appendix, by Harry T. Marshall and Ralph T. Edwards; Paragonimiasis in the Philippine Islands, by W. E. Musgrave; A Consideration of some of the Modern Theories in Relation to Immunity, by Paul C. Freer; and Studies in Plague Immunity,

by Richard P. Strong. A number of papers which represent last year's work are still in press. Among these are articles by Doctors Musgrave and Marshall on Gangosa in the Philippine Islands, and a paper on Infant Feeding, by Doctor Musgrave. The following investigations are under way, but not yet completed: Doctor Musgrave and Mr. Clegg are occupied in a study of parasitic appendicitis, for which material is on hand, and a consideration of the treatment of malaria, with statistical studies of the cases in St. Paul's Hospital. Abundant material for this work is also available. Clinical observations on beriberi are partially advanced, but much more needs to be done. The same is true of the work on the subject of the use of the Roentgen rays in the treatment of this disease. Doctor Musgrave has also continued some of his previous work on amoebiasis, reports on 10 cases of amoebic cystitis, 2 of amoebiaemia, and 50 of amoebiasis without diarrhea, being practically ready. The investigation on the symbiosis of amoebae and its influence on the pathogenesis of the organism, the influences governing its virulence and observations on the biologic history of amoebae are being continued. Doctor Musgrave has also just undertaken a series of studies on the biology and the cultivation of the *Bacillus leproae* and on the transmission of leprosy to lower animals.

Doctors Musgrave and Bowman have begun a study of endemic parotitis. Doctor Marshall has studied and completed a work on a nodular form of amoebic dysentery and has finished a paper on gangosa in the Philippine Islands in conjunction with Doctor Musgrave. He has ready for publication a discussion of the histology of yaws and has undertaken the study of the toxins of the dysentery bacillus and of the cholera spirillum. He also proposes to begin work on the etiology and serum treatment of beriberi.

Doctor Edwards is engaged on the subject of conjunctivitis of the Tropics, and the study of certain fluke infections.

Doctor Ohno has been at work on the various types of dysentery bacillus; in addition he has endeavored to begin the preparation of rabies virus from material found in Manila and has carried the work along to a point where success seems reasonably certain. He has also undertaken the isolation and preparation of nitrogen absorbing bacilli, so that in the future a supply may be available for agricultural work. The manufacture of mallein in the bureau of science has also been in the hands of Doctor Ohno.

The work of Doctor Garrison has already been mentioned in brief. He is engaged in a study of the life cycle of the trematodes, and it is hoped that this obscure question may be cleared up in this laboratory.

The routine work of the biological laboratory has been lessened during the past year by absence of epidemic diseases, so that it has been easy to keep it on a proper plane. However, a force must always be in readiness properly to handle any emergencies which may be brought about by epidemics.

The investigations which have been begun and outlines of which have been given above may seem too ambitious for the force we have and unquestionably some of the topics will not lead to far-reaching results, but out of the entire number some researches should result. The biological laboratory can only accomplish good results by a continuous and earnest attention to laboratory and, if possible, clinical investigation, by an effort at all times to secure material, even at personal sacrifice of time and inclination, and by a continued policy of actively and energetically pushing forward in its own field. It is not to be presumed that a man can always have at hand an absorbing and important topic. Research work in medicine must go with the materials available, but it is certain that any member of the biological laboratory who hopes to continue his connection with the bureau must continually be prepared to make the most of his opportunities and to spend his time when not engaged in routine work in investigations in which he makes an effort to find, and not simply in waiting for what may come to his hands.

THE PATHOLOGICAL MUSEUM.

Mr. Willyoung in the last few weeks has undertaken the preparation of a card catalogue of the pathological museum and the relabelling with printed labels of all of the exhibits. This step has become necessary, owing to the growth of the collection, and it must be pushed rapidly to completion if we wish ultimately to avoid some loss. In addition to his work in sectioning and the preparation and care of specimens for the pathological museum, Mr. Willyoung was sent twice on trips through the islands to assist the bureau of health in the positive diagnosis of leprosy in the cases of individuals to be transferred to the leper colony.

THE SERUM SECTION OF THE BIOLOGICAL LABORATORY.

The serum section of the biological laboratory on January 1, 1907, gave up the care and immunization of cattle expended in preparing rinderpest serum, this work being transferred to the bureau of agriculture. Up to that date the preparation of antirinderpest serum was in immediate charge of Mr. Albert M. Newby. The bureau in the first days of the fiscal year had its cold storage stocked with about 1,200 bottles of antirinderpest serum, and as no epidemics of rinderpest of a serious nature were reported, it was decided gradually to eliminate from the herd a number of animals which were not desirable and to keep it at a minimum in the belief that the reserve serum would be sufficient to last the bureau through the interval of time necessary to bring new animals to a point where it could be taken. However, early in the year the call for serum from the bureau of agriculture became very serious, and the reserve was rapidly exhausted, so that this bureau was once more compelled to purchase a large number of animals and increase its herd. Seventy-two serum animals were transferred to the bureau of agriculture on January 1, and since that time the latter bureau has also been making extensive purchases. The system adopted is as follows: The bureau of agriculture sends to the bureau of science all serum after it is separated from the clots, the shipments being in 5-liter, sterile bottles. This serum is then centrifuged, filtered, tested for sterility, and bottled in the serum laboratory of the bureau of science.

One difficulty in the past and a cause of grave loss of serum has been its contamination by organisms. In the Philippine Islands during the dry season, when dust from the streets pervades everything, it is almost impossible to carry on an operation, such as the taking of serum from rinderpest animals, where large quantities are required, in an absolutely sterile manner. Filtering does not seem to be feasible, as it soon clogs the filter, but in the latter part of 1906 it was ascertained that centrifugating the serum, and subsequently filtering it, rendered the latter operation easy, and beginning with that time, all rinderpest serum has been centrifugated and filtered, so that losses from contamination are now avoided. As our present centrifuge is a small one and entirely inadequate to do the work, it was decided to purchase a large machine capable of holding 10 liters at one time, and also to order a second serum filtering apparatus, a duplicate of the present one, so that when necessary we could handle large quantities at a time. The apparatus has been ordered and it presumably will reach here before the end of the present year. It has a capacity of 10 liters and will require about 12 horsepower. When this new machine is in place it is hoped that we will be able directly to centrifugate the blood of the animals and not be under the necessity of allowing it to stand for the formation of the clot. The process of centrifugating blood should increase the yield of the serum very materially, and in that way cut down the expense of operation so that the centrifuge will pay for itself in a little over a year.

The preparation of vaccine virus has continued steadily throughout the year and no difficulty has been encountered in keeping on hand a sufficient supply of active virus to meet the demands.

We have had some trouble with our serum horses during the past year, especially with the ones we were immunizing with the living, virulent cultures of the pest bacillus. It has been found impracticable to employ old or condemned horses, as a number of this class developed severe arthritis in the legs, from which they could not recover. It appears that if living, virulent cultures of the *Bacillus pestis* are injected intravenously into a horse not perfectly sound serious inflammation results. We have therefore been compelled to change to the use of perfectly sound horses, and with these we have as yet had no difficulty.

Antidiphtheritic and antitetanic serum has been supplied by the laboratory for some time and no change has been made in the methods of preparation. An increased demand for antitetanic serum has been evident during the year.

We are now immunizing horses against cholera, and hope, if we should have the misfortune to have a more or less severe outbreak of that disease, to have an opportunity of testing the curative value of the serum at the contagious disease hospital of the bureau of health.

The serum for bacillary dysentery and for typhoid will soon be ready for distribution. The demand for cholera prophylactic and plague prophylactic has been practically nothing during the year, as no epidemics or even cases of the diseases in question have occurred. The demand for mallein has also been limited, as glanders has become less frequent, but we have kept on hand a sufficient quantity of this product to meet the demand.

INVESTIGATIONS OF THE SERUM SECTION.

A study of the etiology of rinderpest has been continued as vigorously as opportunity would permit, but no very positive results have been reached. We have not been able to cultivate the organism, and we have only been in a position absolutely to prove that the infectious material will not pass through the Berkefeld filter. Work in rinderpest will be continued, and although the subject is one which has engaged the attention of the most prominent investigators in the field of bacteriology, it is nevertheless hoped that by continuous application and with proper methods we may be able to make a decided advance in this line. It would be a matter of fundamental importance if, by cultivating the bacillus, if such it be, we could eventually be able to support the virulent organism *in vitro*. The subject is certainly of sufficient importance to warrant an outlay of time and money, although it is possible that no fundamental results will be obtained. The fact that the organism does not pass the Berkefeld filter would seem to indicate that it should be visible under the microscope. An ultramicroscope reached this bureau some four or five months ago, and it was hoped that with this instrument further advance could be made in the study of rinderpest. However, up to the present time we have had no opportunity to use the apparatus in any of our work.

THE BOTANICAL SECTION OF THE BIOLOGICAL LABORATORY.

The botanical section of the biological laboratory, as in the past, has been mainly engaged in pushing the herbarium and systematic botany. It has continued its good relations with the botanical workers abroad and its policy to obtain a return for the materials sent out. The identifications of the foreign investigators on Philippine materials have all been sent to the Philippine Journal of Science. Mr. Merrill went on a long leave toward the end of the year, after completing one of the most important expeditions, from a botanical standpoint, that has been undertaken in the islands—namely, the ascent of Mount Halcon, in conjunction with Maj. Edgar A. Mearns, of the Army; Mr. Merrill having the privilege of accompanying the expedition organized by Maj. Gen. Leonard Wood.

The herbarium at present contains somewhat more than 46,400 mounted sheets, well arranged in herbarium cases, but as has been mentioned in the past reports, it is located in extremely cramped quarters. The additions received during the year were 7,226 foreign and 8,749 sheets of local material. This is a larger amount, of both local and foreign material, than has been acquired during any previous year.

During the past year we have been engaged in a systematic collection of wood samples, properly identified and labeled, with herbarium specimens to accompany them. With the aid of the forestry bureau this collection has been rapidly augmented, so that at the present time it contains representatives of a majority of the commoner commercial woods of the islands. Of course there is need of a large amount of collecting work before this series can be considered as approaching completion, but even now it is crowded for space, as is the case with the herbarium.

Early in the past year we built a bamboo structure for orchids to the rear of the main building, and a large number of these plants have been brought in for study. Many of these orchids have been sent to America to Mr. Oakes Ames, of the Ames Botanical Laboratory, North Easton, Mass., for identification, and a paper on this material was published in the botanical section of the Philippine Journal of Science.

Many determinations of botanical material sent in by the bureau of forestry and by private persons have been made during the past year, and several thousand of wood specimens have also been undertaken for the bureau of forestry. Throughout, there has been the heartiest cooperation between this bureau, the bureau of education, and the bureau of forestry. For the past five months the timber-testing laboratory at Billbid Prison, in charge of the bureau of forestry, has been conducted by Doctor Foxworthy, of the botanical section of this bureau. The publications of the bureau on botanical subjects may be ascertained by consulting the Philippine Journal of Science.

Doctor Foxworthy has continued his studies on the comparative anatomy and histology of Philippine woods, and the first paper on the subject will very soon appear. The work of Doctor Foxworthy relating to Philippine *Gymnosperms* and

Philippine *Casuarinaceæ* is not nearer completion than it was last year, as the necessary literature is still lacking.

A number of observations and records regarding the growth and the physical and chemical properties of commercial woods have been begun. Studies in conjunction with the bureau of forestry on the determination and classification of forest trees and forest products are under way.

THE ENTOMOLOGICAL SECTION OF THE BIOLOGICAL LABORATORY.

The entomological section has undertaken experiments in the cultivation of silkworms as one of the new features of the work, and the investigation of mosquitoes with reference to their life history and to the transmission of malaria by the Philippine forms has been continued. A list of 83 species of mosquitoes has already been published, among which are 8 new ones and 1 new genus, and material now on hand will bring the number of species up to 100. A series of papers on the anatomy and biology of Philippine mosquitoes, including many drawings and various notes of the different stages of the life cycle, is well under way, but certain important gaps will need to be filled in before the work can be published.

The entomological collection has steadily grown, and much work in identification and arrangement of specimens has been done both by Mr. Schultze and by Mr. Banks. A large number of identifications were accomplished by Mr. Schultze during his leave in Europe. The work, as is the case with botany, suffers much from lack of space and of assistance in the routine of pinning and caring for insects. It seems probable that rather than to engage one man especially for this purpose we might train students of the high and normal schools to undertake this work at a small compensation, sufficient, perhaps, to help out in their school expenses. Two of these young men have already been tried and have proved themselves to be very useful, and possibly we can extend this service to advantage.

The work of the systematic collection of entomological material has necessarily been kept in abeyance, owing to our desire to cultivate the larger field of investigation looking to the prosperity of the islands. It is hoped that during the next year we can arrange some sale system by which we can obtain an income from the entomological work.

The past year has brought fewer notices of the ravages of locusts than previously.

THE ZOOLOGICAL SECTION OF THE BIOLOGICAL LABORATORY.

Field work during the past year has been conducted especially for the purpose of collecting birds, although land shells, reptiles, some mammals and representatives of other fauna were brought in by the expeditions sent out. The districts first covered were in Bantayan, Cebu, and at Toledo and Minglanilla in the latter island. Subsequently, a party was dispatched to Zamboanga and thence to Isabela on Basilan Island, and finally in May, 1907, Messrs. McGregor and Celestino visited the island of Batan, in the Batanes Group, collecting for about two weeks, and afterwards spending a month on the island of Camiguin to the north of Aparri. Five papers have been published in the Philippine Journal of Science and four are ready for the press. Important exchanges of specimens have also been made with the museum at Honolulu. The collection of bird skins and of other specimens is steadily growing, and the number of duplicates is now sufficient for us vigorously to push the question of their sale. Indeed, it might be proper for the bureau to attempt to prepare specimens in other directions for sale, also, and ultimately to establish a sales department similar to that in operation at the aquarium in Naples.

THE SECTION OF FISH AND FISHERIES OF THE BIOLOGICAL LABORATORY.

This section of the work was only begun in March of the current year, when Mr. Alvin J. Seale was engaged to undertake the organization of the work. Mr. Seale before coming to the islands spent a month in the study of the latest methods of the commercial fisheries on the Atlantic coast of the United States. He visited the fisheries of New York, Boston, Gloucester, and the Potomac. Letters to the managers of the principal fishing companies were procured through the courtesy of the United States Bureau of Fisheries, so that a close inspection of the factories, vessels, nets, and other paraphernalia was possible. Mr. Seale

paid especial attention to a study of the curing, canning, and disposition of the catch. On coming to the islands he brought with him 200 large-mouth black bass, which were secured at Fulsom, Cal., and transplanted, with the loss of only 23 individuals. These were planted in three localities at Bagulo, and on July 1 they were reported as being alive and doing well. At the same time 2,000 of the eggs of the rainbow trout were brought, and almost all of these hatched, but owing to the high temperature of the water the process was so accelerated that the young fish had not sufficient strength to survive. It is possible that, if the eggs were to reach here at the beginning of the cool season, when on occasions ice occurs on the higher Benguet plateau, young trout might be sufficiently large and strong at the beginning of the summer months to withstand the temperature. However, it is believed that small-mouth black bass would be better adapted to the streams.

In beginning the work in the Philippine Islands, and in order to avoid expensive mistakes in developing the fisheries, the first essential is a thorough knowledge of the fish which are to be found, and therefore a catalogue has been started covering points to be investigated in regard to every food fish in the islands. The catalogue contains the native name of each fish listed, as well as the English and scientific one; the life history—that is, where the fish is found, at what seasons, where the eggs are deposited, how the young fry develop, and what food is taken. It gives the method of capture, of preserving and selling, and the value, as well as suggestions as to future work. A collection has been started simultaneously and in connection with this catalogue. This will represent the food fish of the islands as rapidly as material becomes available. There are now about 500 specimens. A card catalogue has also been prepared of all the known species of fish in the Philippines, and one on the literature relating to the fisheries of these islands and the adjacent waters is also under way. Mr. Seale has visited the markets each morning and has noted the different varieties brought in, as well as their approximate abundance, and he has generally secured unfamiliar species for identification. He has differentiated those which are known to be poisonous or otherwise to be injurious. The fishing villages so far visited have been only Pasay, Malabon, and some parts of Tondo, where the native methods of fishing, as well as the nets used, have been studied. Mr. Seale also went out with the Japanese fishermen operating in Manila Bay, and has observed the method they employ and the fish they secure. There is a prosperous and growing industry carried on by Chinamen in the smoking and drying of fish in Tondo, and it is believed that this method of utilizing the food fish of the country is capable of great expansion. A study of the fish ponds has been carried on in the neighborhood of Manila, and a considerable amount of information is now available. Only the streams near Manila and the vicinity of Bagulo, Benguet, have as yet been reached. A fair number of small goby were found in the Trinidad River near Bagulo, and these proved to be of a species new to science. They will furnish a plentiful food supply for the black bass which have been planted.

There can be no doubt as to the great value of the Philippine fisheries. There occur here the well-known bangos or milk fish, the banak or mullet, many species of groupers (lapo lapo), snappers, pompano, tarpon, bonito, mackerel, and also herring and anchovies in countless numbers. The fisheries are not only capable, so far as the supply is concerned, of filling the needs of the home market, but a large export trade with China should be started.

The fish-survey vessel *Albatross* will leave for these waters about September 1 and will spend some time in exploratory work, but it should once more be emphasized that the islands can not depend on this work alone for advancing the interests of their fisheries in the best manner.

NEED OF A DIVISION OF FISHERIES.

The section of fish and fisheries of the biological laboratory should be changed so as to give it the status of a division and ultimately it must have a permanent force, equipment, and laboratories. Not only the fish, but, as has been pointed out in previous reports, sponges, corals, pearl oysters, and other marine organisms are valuable, and it is as true in this work as in any other that commercial advance and application can only come as a result of careful scientific study. In other words, it is my hope to see established here a well-equipped marine biological laboratory, with aquaria, and a central station for investigation in Manila, with one or more floating stations in various parts of the islands. The expense of this undertaking will undoubtedly be returned

to the islands many fold in the advance of the fishing industry. When this industry is placed upon a more advanced footing and when the profits from the sale of dried fish to China and other countries begin to be apparent, it would not be unreasonable to impose a net tax on all fishing companies, and in that way pay the expenses of the marine biological survey. At the present time this would not be feasible, so that the suggestion applies only to the period when the business of the fisheries shall have been thoroughly established on modern lines.

It is one of the most important undertakings to have the study of marine fauna pushed as energetically and rapidly as is possible, and it is hoped that when the *Albatross* departs, the Philippine government will be in a position to carry on the work thoroughly and well with a sufficient laboratory force and appliances, and it will then be asked to foster this division as assiduously as possible.

THE CHEMICAL DIVISION.

During the past year it has been found necessary to divide the chemical laboratory into two sections—(a) the section of general analytical work and organic chemistry, and (b) that of weights, measures, and mineral analyses.

THE GENERAL ANALYTICAL AND ORGANIC SECTION OF THE CHEMICAL LABORATORY.

The routine work of this section has increased very much, but a falling off has appeared in the last month or so. Approximately twice as many analyses were handled during the past fiscal year as in the preceding one. The increase has arisen in part from certain classes of work sent in by other government bureaus, but it is also due to the fact that the commercial interests in the islands are gradually coming to realize the money value to them of accurate chemical laboratory work and the laboratories therefore are frequently called upon for assistance by merchants.

The routine work has been such that it usually required the time of three chemists and in addition a portion of the time of all of the force of the chemical staff, but whenever opportunity offers they do some of the work of investigation. The analyses have been systematized as far as possible by confining each chemist to a certain class of work, and frequent consultations of the members of the staff are held to develop the best and the quickest methods of procedure. It has therefore been possible for the men to handle more work than formerly. Weekly meetings of the chemists are held, at which the recent advances in the science and the possibilities of the development of the economic products of the Philippines are discussed.

PUBLICATIONS AND INVESTIGATIONS OF THE CHEMICAL LABORATORY.

Doctor Clover, during the year, completed and published the results of his investigations on the terpenes of Manila elemi, which has occupied his spare time during two years. He showed that the resin from an individual tree usually contains but one terpene, and in that way, by studying the individual samples, he was able to identify the various terpenes which go to form the mixture known as Manila elemi, and to study their properties. The terpenes from Manila elemi would unquestionably be useful in varnish making, and the residue which is left after distillation would also seem to be very excellent for this purpose, but it appears desirable, as we have at our command in the Philippines a large amount of this product, and therefore are in a position to secure practically pure terpenes, that this subject be investigated as to the possibility of securing a higher standing for the oils than in the manufacture of varnish, namely, to utilize them for synthetic work. But little has been done with this class of chemical bodies in this respect, but it does not seem at all hopeless to carry on the work and ultimately to be in a position to synthesize a number of higher important commercial products from the terpenes in question. Work of this kind involves the best type of chemical research, and of course successful results can not be guaranteed, but at the present time indications are not wanting that one way of utilizing these products has been found, and work in this direction will be developed during the coming year. In order to make the synthetic work possible a complete knowledge of the terpenes themselves is needed, and this was supplied by Doctor Clover.

Doctor Clover left the service of the government on January 15, and Mr. Richmond was promoted to his place. During the first part of the year Mr. Richmond completed his work on the Philippine fibers and fibrous substances and their suitability for paper making, the later months being devoted especially to a study of the woods and of the applicability of the sulphite process to the preparation of paper pulp from hemp waste and the Philippine grasses. It certainly would be an advantage if these materials could be worked by the sulphite process, as is the case with wood pulp; and Mr. Richmond's results show that it is perfectly feasible and in fact advantageous to make paper from hemp waste and from grasses by this method. All of the results have been published in the *Journal of Science*. Mr. Richmond has shown that good paper can be prepared from cogon grass, from bamboo—both the dwarf bamboo and the structural variety—from the waste from hemp, from a number of Philippine woods, most prominent among which is lauan, and from other Philippine materials.

Mr. Richmond is now beginning the study of the Philippine oils and the resources of the islands in this direction. A preliminary discussion of the subject is already at hand and was written before Mr. Richmond left on his vacation for the United States. The subject is one which will call for much further study, and it probably will extend over a year or a year and a half, but its importance is such that the results will warrant the time and expense. A number of oils other than those now considered commercially can be prepared in the Philippines and can take their place in the world's market, and it is the object of this bureau to make the information concerning these products available in such a way that the manufacturer will interest himself in the subject.

Doctor Bacon during the year completed a preliminary discussion of the Philippine medicinal plants. He investigated about 15 of the most important native plants belonging to this class and did some work on the physiologically active constituents which he isolated. Judgment in regard to the value of all of this material will have to be delayed until we can have in the Philippine Islands a trained pharmacologist; indeed, it scarcely seems advisable to continue to spend large amounts of time on Philippine medicinal plants, unless such a specialist is on the ground and until we can be in a position to have cooperation between the chemists and the pharmacologist. When this time arrives the work, with the aid of the botanists, will once more be vigorously pushed. Dita bark seems to contain a very active alkaloid, echitamine, and a number of plants have been discovered which give a considerable quantity of berberine.

A number of the native fish and arrow poisons have also been isolated and studied. The fish poisons belong to the class of saponins. Biological work on this subject was carried on by Doctor Marshall in conjunction with Doctor Bacon and published in the *Philippine Journal of Science*. Dr. Bacon also visited Taal Volcano during the year and once more collected a number of samples of interesting waters from the crater lakes, especially obtaining material from the central hot lake where this had previously been impossible. The analyses of these waters furnished the basis for a memoir on the crater lakes of Taal Volcano. Opportunity presented itself while the question of the radio activity of these waters was being investigated, to study the catalysis of various substances by means of uranium salts in the sunlight. This paper is entirely of theoretic interest; but as it could be carried on without disadvantage, the results were published. The value of the study lies in the fact that it gives a means for the quantitative measurement of the effect of the tropical sunlight, as compared with that of temperate zones. Doctor Bacon also assisted the director in refuting some criticisms which had been made on work published by the latter while he was connected with the University of Michigan, and as a result an experimental paper on the action of sodium on acetone was prepared and published. Doctor Bacon has taken up the investigation of the gums, resins, and essential oils where Doctor Clover left it.

A study of the oils used in perfume, such as ylang-ylang, champaca, and sampaguita has been begun and some data are available. It is hoped that during the present season we can obtain the cooperation of manufacturers, so that the laboratory will be able to establish normals for these products, which will serve as a basis for valuation.

THE SECTION OF WEIGHTS, MEASURES, AND MINERAL ANALYSES OF THE CHEMICAL LABORATORY.

Act No. 1519 of the Philippine Commission regulating the inspecting and sealing of weights and measures went into effect during the year, and as a result the actual work of standardizing has been begun. All of the weights, measures, and instruments of precision which have gone or are going to the provinces to serve as secondary standards have been compared, and the measuring flasks have been marked. The laboratories have received their fundamental standards from the International Bureau at Paris, and the instrument maker has built a comparator which is sufficiently accurate for all of our purposes.

It became evident during the past few years that the price which has been charged for assays, while it was a reasonable one in this country, was too high to make the assay work of practical value to the miners, and consequently a reduction in the schedule of charges was adopted. The present charge is a very low one, that is \$1 United States currency for a gold assay, as it is scarcely sufficient to cover our expenses, unless very large lots are taken in at a time. However, it seemed extremely desirable in the interests of mineral development to give the miners an opportunity to have accurate and authoritative assays made at a practically nominal charge, especially as so much work of the laboratory is done without any remuneration. The result has been that, whereas for the previous year we had 233 assays to record, during the present one we have 621, and during the season of activity we have been somewhat overcrowded. As a rule very few samples are sent in during the rainy season.

The presence of the assay furnace in the main building became extremely objectionable, as a very good room which would be available for mineral analyses was sacrificed, and consequently a small house was built for assays away from the main building, and in that manner space for one more chemist was obtained. The assay building contains the ore crushers, grinders, and all other necessary machinery and the crucible and muffle furnaces. This improvement has made it possible for us to carry on modern assay work with great facility. The number of coal analyses and of calorific determinations has been very much augmented, owing to the increased interest in Philippine coals. There were 15 of these determinations made during the preceding year and 75 during the present one. These figures do not include the work done for the division of mines and for other bureaus of the government, or for the purposes of research. They simply represent the work done for private individuals for pay.

PHILIPPINE COALS.

Research work has been carried on as extensively as possible and a number of contributions from this section have appeared in the Philippine Journal of Science. Doctor Cox made extensive investigations of the coals of the Philippines, giving especial attention to their gas-producing power. All of these coals are noncoking and it probably would not be profitable to use them for ordinary gas making, where the coke is an important by-product, but they could be successfully employed in a producer-gas plant, which would save nearly the entire value. All of our experiments indicate that the most economical method for the consumption of Philippine coals would be as producer gas, and the results have been so promising that the bureau hopes to establish a trial plant in the near future, if funds for this plant are provided by the Commission. When it is in operation we can add very definite data to our present information. The empirical methods generally used for the analysis of coals are not applicable to those of the Philippines, owing to certain peculiarities of the latter. The analyses, as carried on by the official method, indicate our coals to be of a much poorer quality than is actually the case. As a result Doctor Cox was compelled to work out a method which gave satisfactory and reliable results and showed our coal to be comparable with the subbituminous coal of America and other places.

The laboratory has been equipped for actual steaming tests under the boiler, and it has endeavored to obtain Philippine coals from representative sources, but unfortunately the amount so available has been very limited, and from many places we have not been able to obtain any at all. Of course we have completed all tests of other coals available in the Manila markets for purposes of comparison, but it is feared that unless we can have brought to the bureau a greater variety of materials the publication of the actual steaming tests will be greatly delayed.

The subject of Philippine coals is of the greatest importance. We suffer here from coal prices which to the commercial world are almost as serious as an epidemic of a contagious disease is to the multitude. Efforts in every direction should be made to advance the production and utilization of our Philippine deposits and to discover how much coal is available, and more especially what its quality is. I have heard Philippine coals condemned by persons who are utterly unaware of their nature or quality. It is true that in order to burn successfully many varieties will probably need a specially constructed fire box in the furnace, as the gas produced from this coal is so excessive as to cause great heat in the stack and loss in the fire box, but surely boilers and fire boxes can without great difficulty be so constructed as to take advantage of this condition, and certainly these coals can be used to great advantage in a producer furnace, by which means nearly all the combustible material will be made available. It is not good commercial practice to condemn a material simply on hearsay, but it is good commercial practice thoroughly to study and examine coal which is as plentiful as that in the Philippine Islands and to ascertain the best method for its utilization. A reduction in the price of coal would be an inestimable gain to the inhabitants of the islands. I believe that the government should foster coal development in every way within its power, and the building of the producer-gas plant would be one of the means by which this could be accomplished.

PHILIPPINE CLAYS.

Information relative to the quality and distribution of clays in the Philippines is being sought more and more frequently and therefore we have undertaken work in this direction, paying attention to possible cement materials. The difficulty which the chemical division labors under is that while many clays are brought in and found to be proper for use, our knowledge of the extent of the deposits, their area, cubical contents, etc., is most meager, and also, with the exception of a few places in Ilocos Norte, we have not as yet developed a knowledge of ample deposits of feldspar and quartz to assist in porcelain making. The mining division, owing to its reorganization, has a position vacant, and it is proposed to engage therein a man qualified especially for this work.

THE DIVISION OF MINES.

Mr. H. D. McCaskey, formerly chief of the bureau of mines, and afterwards chief of this division in the bureau of science, left for the United States on July 1. Mr. Eveland, after completing his work on the survey in Benguet, resigned on January 15 of this year, and Mr. McCaskey, without returning, also severed his connection with the bureau; consequently the work of the division of mines has been in a somewhat disorganized condition. Mr. Ickis was on vacation in the United States from August 2 to February 22, and as a result we had practically only one man in the field from July to September. Mr. Smith was engaged on petrographic work on the Benguet rocks and in the care of the fossil material, but during the month of September he was able to visit Ilocos Norte to investigate the reported asbestos and manganese deposits in that region. The results have been published in the Philippine Journal of Science. After October 1 and to December 5 Mr. Smith was not only writing up his material obtained in Ilocos Norte, but preparing for extended field work in Cebu, where much of the map work had previously been prepared by Messrs. Goodman and Ickis. On December 5 Mr. Smith took the field and began the large undertaking of geologic mapping of the coal regions of Compostela and Danao fields in Cebu. He was joined by Mr. Goodman in January, so as to facilitate the work on the map. Mr. Smith, upon his return from Cebu, was placed in temporary charge of the division and has continued as acting director up to the present time.

The extensive investigations into the geology of the coal regions of Cebu and the preparation of the map, as well as the working up of the materials which were then obtained, have occupied much of his time, but on April 21 he was able to accompany an expedition of the First Battalion of the Second Regiment of the United States Marines, Maj. E. H. Cole, commanding, from Olongapo to Mount Pinatubo, in Zambales Province. They returned to Manila on May 2. During this time he made a rapid reconnaissance of this unknown region and also did some work in the vicinity of Subig Bay. Mr. Ickis returned to Manila on February 22 and was at once dispatched to the Camarines to make a preliminary inspection of the gold region in the vicinity of Paracale and Mambulao. From there he went to the island of Polillo to inspect the coal workings, and

thence overland from Infanta to Manila. The report is now being carefully prepared, as much material has been gathered. Preliminary suggestions in regard to this region were published in the mining number of the *Far Eastern Review*.

Mr. Henry G. Ferguson arrived in Manila on March 28 to take the place left vacant by Mr. Eveland, and for the first month after his arrival he assisted very largely in the petrographic work. On May 19 he was sent as a member of an expedition of scientists to the Batanes Islands, and subsequently he proceeded to the island of Camiguin, to the north of Aparri. The material gathered on this trip, which relates to a group of islands but little known, is being prepared for publication.

Mr. Goodman also made a rapid reconnoissance in the latter part of 1906 in the island of Marinduque, paying particular attention to the lead deposits reported to occur there. He was gone in the field about a month.

Owing to the disorganized condition of the division, to the separation of so many men, and to the fact that Mr. Ickis was on leave, no publication excepting a contribution to the physiography of Cebu Island, by W. D. Smith, was made, but since we have once more begun systematic work, press bulletin notices have been issued in each number of the *Far Eastern Review*, the division of mines having adopted this means of reaching the public with information of interest relating to mining subjects. These bulletins contain special announcements, short articles of commercial interest, discussion so far as is possible of nonmetallic minerals, and quotations and prices of chemicals and metals. The division has also cooperated in the editing of the mining edition of the *Far Eastern Review* and contributed four articles thereto.

ORGANIZATION OF THE DIVISION OF MINES.

It became evident that to obtain the best results a reorganization of the division was necessary, with a graded list of salaries so arranged as to give each one an opportunity for promotion. After the final adjustment the division will be as follows: A chief of the division in charge of geology; a mining engineer who shall have charge of the section of mineral resources; a mining engineer and topographer; a geologist who will take up petrography and ore deposits; an assistant geologist whose work shall be in nonmetallic minerals, such as clays, coals, etc.; and two field assistants. It is proposed in future to abandon the former policy of minute, detailed, and expensive surveys of particular regions which, while of great importance scientifically, do not cover a sufficient amount of territory actually to give us a reconnoissance of the geology of the Philippine Islands. To cover large areas in the minute way in which we began would take resources far greater than we can ever hope to command. Consequently the scope of the work for the future has been planned about as follows:

1. Geological reconnoissance work.
2. The investigation of economic materials, chiefly of fuels and materials for construction.
3. Statistical work.
4. Mapping.

It is proposed to bring the work before the public in the following series of publications:

(a) An annual bulletin on the mineral resources of the Philippine Archipelago, to be issued at the close of each calendar year. This bulletin will be statistical in character and we shall endeavor to gather from all mining sources the results obtained during the preceding year and the value of business done. It should serve as an exact index of the mining industry in the islands.

(b) Special geologic and geographic articles which have a scientific value and which will appear in the *Philippine Journal of Science*.

(c) A system of press bulletins, consisting of short articles and announcements of field work, will as heretofore be given out in the *Far Eastern Review*.

(d) It is also proposed, with each publication in the *Journal*, to issue separate sheets of the geologic and topographic maps, so that they shall be available to the miners.

PROPOSED NEW WORK.

When the work on the Cebu coal regions is completed, and the geologic map is now very nearly ready for the press, Mr. Smith will begin the reconnoissance work in Mindanao which we have long had in mind, while Mr. Ferguson

and Mr. Ickis, with one assistant, will proceed to Bulalacao, in Mindoro, to study the coal fields of that region. Mr. Ickis and the assistant will execute the preliminary triangulation and run one or more level lines for control. Mr. Ferguson will fill in the topography with a plane table and later make an areal map of the geology. While waiting for Mr. Ferguson to be ready to proceed to Mindanao, Mr. Ickis will take the field in Masbate, where he will map approximately 40 square miles. He will then, after the work in Mindoro is completed, be joined by Mr. Ferguson and the assistant. The reconnaissance of Mindanao is planned to cover the Davao district, the district of Cagayan, that of Placer, the Agusan River, and Zamboanga. The party will consist of Mr. Smith, Mr. Goodman, possibly Mr. Ickis or Mr. Ferguson, and an assistant. The commanding general of the department of Mindanao has promised cooperation and assistance, together with the detail of men to make this expedition a success. The work will probably occupy five months. When the party returns three months at least will be needed to finish the report.

PUBLICATIONS OF THE DIVISION OF MINES.

The following articles are in press or completed for publication: Geography and Geology of the Bagulo Mineral Region, with maps, by A. J. Eveland; Petrography of Some Benguet Rocks, by W. D. Smith; The Asbestos and Manganese Deposits and Related Geology of Ilocos Norte, Luzon, P. I., by W. D. Smith; The Compostela-Danao-Carmen Coal Fields of Cebu, P. I., with topographic, geologic maps, and relief models, by W. D. Smith and J. G. Gwastney; Contributions to the Physiography of the Philippine Islands: the Region of Mount Pinatubo, Zambales Province, P. I., by W. D. Smith; Geological Reconnaissance from Infanta to Laguna de Bay, Luzon, P. I., by H. M. Ickis.

NEEDS OF THE DIVISION.

The division has just passed through its reorganization and it is yet too early to expect the greatest results. However, it might be well here to mention some of the needs I have suggested in the preceding year. One necessity consists in more ample floor space. The geologic, paleontologic, and petrographic collections are growing, and with the field work planned, together with the method of rapid reconnaissance, these necessary adjuncts to geologic work will increase more rapidly in the future than in the past. There certainly should be here a well-organized collection typifying the mineral resources of the islands, and it is impossible to care for such a collection in the few rooms which can now be assigned to the division. The plan of the laboratory wing which has been prepared will make ample provision for necessary expansion, and it is hoped that before another year is completed we may be in a position to advance our collection rapidly. The library of the geologic, mineralogic, and petrographic section of the work has grown as rapidly as funds would permit, but, just as is the case with the work in fisheries, we are as yet but poorly equipped. Other divisions which began at the time of the organization of the bureau of government laboratories are therefore far ahead of the later additions, and much must be done in the way of giving the division of mines more ample library facilities.

The subject of topographic surveys has already been mentioned. The success of the division of mines depends upon this class of work, and we could cover very much more ground if we were able to rely upon completed topographic maps. However, as at the present time this is out of the question, the division must endeavor to do what it can. In the last appropriation bill there were given to the division of mines two positions for topographers. The opportunity to study on new geological work is so great that it might not be impossible to obtain two promising young men, just finishing their bachelor's course in the United States, as temporary assistants for one or more years. The salary would be enough to pay expenses, and what these graduates would learn would more than amply repay them for the time spent in coming here. Until we can discover whether this course is feasible, the two positions in question will be filled temporarily as field work requires.

It is hoped that within the next year the plans which have been outlined will have given encouraging results. Everyone realizes that we could do more with twice the staff and still more with three times the number of men, but our work in the field of mining and geology must be limited by the sums which the government can actually afford, and it is to the interest of every member

of the division actively to push his work within the means allowed him and not to let his mind dwell on what might be possible were he confronted by different conditions. Active cooperation between the mining and chemical divisions is necessary, with full realization that research is for all who have the means and talent, and that no arbitrary line can be drawn where the functions of one division cease and those of the other began without seriously hampering work which is in the interest of the islands.

THE DIVISION OF ETHNOLOGY.

The division of ethnology of the bureau of education was transferred to the bureau of science on November 1, 1906. From the time of its beginning as the bureau of non-Christian tribes, this portion of the scientific work of the government has been moved from one place to another. In each instance a great loss of valuable material resulted. There was absolutely no space in the bureau of education for displaying what was on hand, and owing to the activity of the exposition board for the Louisiana Purchase Exposition, much material was gathered in the last few years which urgently needed attention and display. The method of storing the exhibits and the numerous transfers to which the glass cases had been subjected resulted in much destruction and breakage. It was consequently a great advance in the interests of this division when the bureau of science was able to secure the control of the entire upper floor of the building formerly occupied by the bureau of architecture. The length is approximately 150 feet and the width about 70 feet, the floor space being divided by half partitions. After this building had definitely been assigned to the bureau of science, contracts were let for its repair and for the construction of a number of glass cases and frames to display the exhibits. The moving was very much delayed and only completed at the time of writing, so that the work of the division in the immediate future must be the thorough overhauling, cleaning, and repairing of all exhibits and the placing of them in their future locations. It is intended to open this museum to the public, but obviously this can not be done until everything is in order. An inspection of the material on hand makes it evident that some money will need to be expended for the hire of mechanics to fit glass and to repair the exhibits which have become broken.

The ethnological work has suffered, owing to the fact that Dr. Merton L. Miller, its chief, was most seriously ill during the year and was finally compelled to leave for the United States for vacation and recuperation. He will return about the middle of October. During this interval the affairs of the division have been in charge of Mr. Christie, who has been at work on the material gathered during a trip to Mindanao, where he studied the customs, habits, and ethnology of the Subanos. The publication has not been completed, it having been delayed by the unfortunate surroundings of the division, and now Mr. Christie's time will need to be devoted to placing the exhibits in their proper order. The manuscript will be thoroughly edited and prepared for publication upon the return of Doctor Miller. Two other manuscripts have been submitted and are now in the hands of the printer. One an English-Igorot Vocabulary, by the Rev. W. C. Clapp, and the other on the Batan Dialect as a member of the Philippine Group of Malayan Languages, by Otto Scheerer. Both of these are important contributions to linguistic studies and they will be useful to travelers. It has therefore been decided not to publish them as numbers of the Philippine Journal of Science, but rather to issue them in the same form as the Journal and as separate publications at cost price. Another manuscript of Dr. Najeeb M. Saleeby on the history of the Moros is now in the hands of Doctor Miller for editorial reading.

With the aid of the division of mines, as good a map as is possible at the present time of Jolo and Mindanao has been prepared to accompany Doctor Saleeby's work, the second portion of which will relate to the Moros of Mindanao.

It is hoped that all the papers now in preparation will be published during the coming year, but necessarily they are all somewhat delayed owing to the absence of Doctor Miller.

In its present quarters, with its staff intact and with its increased facilities for caring for exhibits, the ethnological division should begin a new era, and we should steadily endeavor to increase our collection. If such collections are

delayed too long the available material for them will rapidly diminish, and later great difficulty will be encountered in completing a picture of the wild tribes of the Philippine Islands as they at present exist. It will be the aim of the bureau to foster this division to as great an extent as its means will permit.

THE PHOTOGRAPHER.

The number of prints made during the last fiscal year was very much greater than in any similar preceding period, the total being well over 20,000. One class of work was undertaken for which there had previously not been much demand, for during the year we made 319 lantern slides. The photographer, Mr. Martin, made two expeditions, one to Mindanao, where he photographed a good series of Subanos, taking about five weeks, and another to Mayon, where he obtained collections from the volcano, having ascended the summit of the mountain during the expedition. The work of replacing the old negative envelopes, of cataloguing and classifying all negatives, and of completing the catalogue begun by the honorable the secretary of the interior occupied about six weeks toward the end of the fiscal year. In order to make the work at all possible four temporary employees were engaged, who spent all their time on our negatives. The result is that at the present time all the envelopes have been typewritten, the negatives have been classified and numbered, both in the regular album and catalogue, and only a few varied subjects remain to be adjusted.

THE POWER PLANT.

There have been no additions to or alterations in the power plant, the only change being in fitting up the boilers to make evaporation tests of fuels. During the latter part of the year we obtained from the bureau of forestry, by transfer, an impregnating apparatus for wood, which is sufficiently large to handle a railroad tie. The apparatus is now set up in the boiler room and prepared for operation. One difficulty lies in the fact that the cost of creosote in these islands is high.

The engineer during the year has prepared a plan for a producer-gas plant, which we hope to be able to erect in connection with our boilers, and in which we expect thoroughly to test our Philippine coals. The cold-storage room has been improved by additional insulation, and in that way we have very much cut down the expense. The workshop has completed quite a number of jobs, and much has been done in the way of repairing and keeping apparatus in order. A new universal milling machine has added much to the efficiency of the machine shop. We have during the year been able to employ two or three Filipino boys as student apprentices without pay. The results have been quite satisfactory. So far we have had six of these boys; two have found employment in other bureaus, one in the bureau of navigation, one with a commercial firm in Manila, and two remain as students in the shop. I am,

Very respectfully,

PAUL C. FREER,
Director of the Bureau of Science.

The SECRETARY OF THE INTERIOR,
Manila, P. I.

APPENDIX.

TABLE I.—Comparative table of cash receipts.

Cash sales.	Fiscal year 1906.	Fiscal year 1907.	1906 excess.	1907.
Cattle.....	₱5,595.00	₱2,458.00	₱3,137.00	.....
Photograph.....	1,207.92	8,948.32	.....	₱2,740.40
Analysis.....	1,559.10	2,787.30	.....	1,178.20
Examinations.....	1,927.09	753.70	1,173.39	.....
Assay.....	44.00	1,222.00	.....	1,178.00
Vaccine virus.....	15,445.53	28,422.97	.....	12,977.44
Other serums.....	282.20	1,462.92	.....	1,280.72
Miscellaneous supplies.....	1,635.77	803.25	876.52	.....
Antirinderpest ^b	10,890.00	22,288.05	.....	11,398.05
Unclassified.....	.....	4,314.95	.....	4,314.95
Total.....	38,566.61	66,417.46	5,186.91	35,017.78

Net increase over 1906, ₱20,830.85.

* No cattle sold after January 31, 1907, owing to transfer of rinderpest work to bureau of agriculture.

^b After January 31, 1907, charge made only for preparing here.

* Property condemned and sold, ₱1,082.45; bird skins, ₱3,232.50.

TABLE II.—Comparative table of free work performed by bureau of science for insular bureaus during past three years.¹

JULY 1, 1907.

Department.	Fiscal year 1906.	Fiscal year 1907.	Excess fiscal year 1906.	Excess fiscal year 1907.
Health.....	₱184,067.36	₱60,221.00	₱73,866.36	.....
Civil hospital.....	10,785.00	9,001.00	1,784.00	.....
Customs.....	592.41	927.00	.....	₱334.59
Supply.....	490.00	815.00	.....	325.00
Agriculture.....	3,996.08	520.00	3,476.08	.....
Prisons.....	23,750.00	24,683.00	.....	933.00
Constabulary.....	820.00	146.00	174.00	.....
St. Luke's dispensary.....	71.00	88.00	.....	12.00
Public works.....	363.90	470.00	.....	106.10
Education.....	91.08	120.00	.....	28.92
Treasury.....	9.00	.....	9.00	.....
Printing.....	95.00	285.00	.....	190.00
Internal revenue.....	20.00	281.00	.....	261.00
Secretary of Interior.....	30.00	10.00	20.00	.....
Forestry.....	51.56	221.50	.....	169.94
Public Health and Marine-Hospital Service.....	105.00	6.00	99.00	.....
Navigation.....	2.20	10.00	.....	7.80
Coast and geodetic survey.....	14.92	9.00	5.92	.....
Ethnological survey.....	173.19	.....	173.19	.....
Weather bureau.....	2.88	.....	2.88	.....
Indigent patients.....	6.00	.....	6.00	.....
Cold storage.....	26.64	.....	26.64	.....
Mining.....	176.58	.....	176.58	.....
Total.....	175,2398.0	97,808.50	79,799.50	2,388.35

Net decrease 1907, ₱77,431.30.

¹ 40,000 rats examined in 1906 and prices of vaccine virus reduced from ₱0.03 to ₱0.01 after November 1, 1906, all of which does not appear hereon (cash sales).

TABLE III.—Financial statement, July 1, 1906, to June 30, 1907, fiscal year 1907.

Subject.	Appropriation.	Expended.	Overdrawn.	Balance.
Transportation.....	P8,000.00	P8,046.74	P46.74	.....
Chemicals, apparatus, and supplies.....	20,000.00	21,486.11	1,486.11	.....
Small animals.....	2,000.00	3,130.13	1,130.13	.....
Feed for small animals.....	800.00	2,842.19	1,542.19	.....
Telephones.....	526.00	338.79	.....	P187.21
Ice and distilled water.....	1,638.00	1,115.55	.....	522.45
Office supplies.....	1,500.00	2,485.79	985.79	.....
Herbarium cases.....	350.00	296.00	46.00	.....
Photographic supplies.....	2,500.00	3,387.87	1,487.87	.....
Cablegrams.....	375.00	580.76	205.76	.....
Telegrams.....	600.00	162.60	.....	437.40
Repairs to apparatus, furniture, etc.....	2,250.00	1,542.52	.....	707.48
Post-office box.....	32.00	32.00	.....	.....
Mounting botanical specimens.....	200.00	.....	.....	200.00
Eggs, meat, milk, etc.....	150.00	110.45	.....	39.55
Postage.....	4,000.00	1,813.85	.....	2,186.15
Laundry.....	160.00	382.79	222.79	.....
Alcohol.....	1,000.00	679.89	.....	320.11
Coal, oil, and maintenance of apparatus.....	10,000.00	10,479.72	479.72	.....
Printing and binding.....	20,000.00	20,613.08	613.08	.....
Books and subscriptions.....	6,643.00	11,573.72	4,930.72	.....
Horses, cattle, etc.....	7,900.00	12,184.49	4,284.49	.....
Feed for large animals.....	13,400.00	13,304.22	.....	95.78
Maintenance of city transportation.....	3,100.00	2,064.71	.....	1,015.29
Rental of fire-alarm boxes.....	108.00	108.00	.....	.....
Window awnings.....	60.00	13.20	.....	46.80
Division of ethnology.....	9,500.58	a 7,000.00	.....	2,500.58
Philippine medical school.....	.....	329.00	329.00	.....
Total contingent.....	116,729.58	126,324.17	17,790.28	8,256.75
Reimbursement, traveling expense and half salary.....	15,000.00	27,855.16	12,855.16	.....
Salaries and wages.....	202,708.00	184,008.71	.....	18,699.29
Division of ethnology.....	7,137.99	.....	.....	7,137.99
Total salaries.....	224,845.99	211,863.87	12,885.16	25,837.28
Emergency, 1906.....	1,402.30	.....	.....	1,402.30
Obligations.....	.....	.....	.....	.....
Balance platinum, still available.....	231.17	.....	.....	231.17
Grand total.....	343,271.99	338,188.04	30,645.55	35,729.50
Balance to revert to treasury.....	.....	5,083.95	5,083.95	.....
	343,271.99	343,271.99	35,729.50	35,729.50

* Repairs to Anloague building.

TABLE IV.—Comparative table of serums and other preparations made and disposed of during the fiscal years 1906 and 1907.

JULY 1, 1907.

	1906.	1907.	Excess.	
			1906.	1907.
Vaccine virus:	Units.	Units.	Units.	Units.
Prepared.....	2,230,505	2,804,042	.....	553,587
Disposed of.....	2,316,786	2,846,687	.....	529,902
Antirinderpest:				
Prepared.....	1,712,775	947,800	764,975	.....
Disposed of.....	1,824,225	1,376,550	.....	52,325
Plague prophylactic:				
Prepared.....	.....	.....	.....	.....
Disposed of.....	790	.....	790	.....
Mallein:				
Prepared.....	699	837	.....	138
Disposed of.....	1,976	830	1,146	.....
Diphtheria antitoxin:				
Prepared.....	210,000	.....	210,000	.....
Disposed of.....	23,000	69,500	.....	46,500
Tetanus antitoxin:				
Prepared.....	951,233	4,160,927	.....	3,209,694
Disposed of.....	70,988	1,811,172	.....	1,740,184
Cholera vaccine:				
Prepared.....	15,330	1,710	13,620	.....
Disposed of.....	10,140	1,650	8,490	.....
Antiplague serums:				
Prepared.....	4,620	205	4,415	.....
Disposed of.....	120	30	90	.....

TABLE V.—Comparative table of routine work performed by the bureau of science during the past two fiscal years.

JULY 1, 1907.

	1906.	1907.	Excess.	
			1906.	1907.
CHEMICAL DIVISION.				
Oils, paints, pigments, etc.*		41		41
Clays, soils, fertilizers, cement *		24		24
Fuels, coals, wood, gas, petroleum *		30		30
Rocks and minerals *		6		6
Metals and alloys *		3		3
Food, alcohols, and beverages *		285		285
Water	43	113		70
Urinæ, clinical and toxicological analysis *	801	1,033		232
Miscellaneous	506	780		255
Total	1,349	2,295		946
Assays	233	621		388
Sets weight and measures standardization *		148		148
Total	1,582	3,064		1,482
BIOLOGICAL DIVISION.				
Feces *	3,940	6,300		2,360
Sputum *	4,385	1,682	2,703	
Blood	1,499	2,377		878
Gonococci	15,705	14,169	1,536	
Water	401	150	251	
Miscellaneous *	42,455	1,521	40,934	
Necropsy	396	250	145	
Total	68,780	26,449	45,569	3,238
Shopwork	116	131		15
Miscellaneous division, various works		3		3
Grand total	70,478	26,647	45,569	4,738
Photographs, 5 by 7	8,659	18,355		9,697
Photographs, 8 by 10	384	244	140	
Photographs, 4 by 5		56		56

* Included in miscellaneous, chemical division, in 1906; 40,000 plague-rat examinations, 1906, and toxicological analysis for 1906.

† Increased work at Billbid on account of Doctor Garrison's work.

‡ Only necessary examinations made at Billbid after October, 31, 1906, instead of regular monthly examinations of all patients; net decrease examinations, 41,147.

TABLE VI.—Statement of the value of work performed free of charge for the fiscal year 1907.

	July.	August.	September.	October.	November.	December.
Bureau of health	₱5,077.00	₱5,666.00	₱3,849.00	₱4,486.00	₱4,133.00	₱4,111.00
Civil hospital	1,263.00	1,139.00	633.00	982.00	972.00	643.00
Bureau of customs	25.00	30.00	70.00	41.00	169.50	83.00
Bureau of supply	40.00		25.00	78.00	24.00	415.50
Bureau of agriculture	68.00		10.00	12.00		45.00
Bureau of prisons	1,361.00	3,247.00	945.00	1,575.00	1,768.00	1,794.00
Bureau of constabulary				3.00	59.00	
St. Luke's dispensary	10.00		9.00	12.00	3.00	3.00
Bureau of public works		10.00				
Bureau of education		15.00				105.00
Bureau of treasury						
Bureau of printing	35.00		20.00	30.00	80.00	20.00
Bureau of internal revenue		55.00	81.00	82.50		40.00
Secretary of the interior	10.00					
Public health and marine-hospital service					3.00	3.00
Bureau of forestry				40.00	100.00	20.00
Bureau of navigation					10.00	
Coast and geodetic survey						
Total	7,889.00	10,162.00	5,642.00	7,336.50	7,321.50	7,282.50

TABLE VI.—Statement of the value of work performed free of charge for the fiscal year 1907—Continued.

	January.	February.	March.	April.	May.	June.	Total.
Bureau of health.....	P5,480.00	P3,585.00	P4,252.00	P4,192.00	P6,311.00	P9,079.00	P60,221.00
Civil hospital.....	840.00	698.00	657.00	504.00	432.00	238.00	9,001.00
Bureau of customs.....	78.00	49.00	56.00	176.00	40.00	107.50	927.00
Bureau of supply.....	79.00	9.00	.....	90.00	30.00	29.50	815.00
Bureau of agriculture.....	.....	48.00	278.00	45.00	11.00	13.00	520.00
Bureau of prisons.....	2,279.00	1,780.00	2,897.00	2,480.00	2,247.00	2,280.00	24,568.00
Bureau of constabulary.....	6.00	.....	8.00	.....	.....	75.00	146.00
St. Lukes dispensary.....	16.00	.....	.....	30.00	.....	.....	88.00
Bureau of public works.....	180.00	.....	40.00	115.00	120.00	5.00	470.00
Bureau of education.....	.....	.....	.....	.....	.....	.....	120.00
Bureau of treasury.....	.....	.....	.....	.....	.....	.....	.....
Bureau of printing.....	.....	.....	.....	20.00	70.00	10.00	285.00
Bureau of internal revenue.....	7.50	.....	.....	7.50	7.50	.....	281.00
Secretary of the interior.....	.....	.....	.....	.....	.....	.....	10.00
Public health and marine-hospital service.....	.....	.....	.....	.....	.....	.....	6.00
Bureau of forestry.....	56.50	.....	.....	.....	.....	5.00	221.50
Bureau of navigation.....	.....	.....	.....	.....	.....	.....	10.00
Coast and geodetic survey.....	9.00	.....	.....	.....	.....	.....	9.00
Total.....	9,081.00	6,144.00	8,180.00	7,659.50	9,268.50	11,792.00	97,708.50

APPENDIX E.

REPORT OF THE DIRECTOR OF LANDS.

DEPARTMENT OF THE INTERIOR, DIRECTOR OF LANDS,
Manila, P. I., August 5, 1907.

SIR: I have the honor to submit the annual report of the bureau of lands for the fiscal year ended June 30, 1907. During the year the work of the bureau has materially increased in every department, but the organization outlined in the last report has been maintained and found efficient. The personnel of the bureau has increased from 316 to 637 employees, and yet it is found impossible to keep up the current work, either in the public lands or the surveying division. The personnel has become more permanent during the year and greater efficiency has been obtained. It has been found that the salaries authorized for the chiefs of division, ₱4,000 per annum, were fixed too low to retain in the service the character of men required. It is therefore proposed to increase the salaries of these positions to ₱5,000 per annum in order to attract and hold capable men, as constant changes in the positions of chiefs of division are detrimental to the service, not only causing delay in the business of the division, but also increasing the expenses thereof for the work done.

The 92 employees who are in the classified service and entitled to accrued and vacation leave have earned during the year, under the law for vacation leave, 1,936 days, aggregating ₱13,820.42, while these employees have received leave to the extent of 1,374 days, aggregating ₱8,251.06, leaving 562 days' vacation leave, aggregating ₱5,569.36, earned but not taken. Under the laws governing accrued leave these same employees have earned 2,170 days, aggregating ₱15,867.53, and have received 619 days, aggregating ₱5,489.44, leaving liabilities to the bureau to the extent of 1,551 days, aggregating ₱10,378.09. Seventy per cent of the vacation leave due and 29½ per cent of the accrued leave earned by employees was taken. As the personnel is comparatively new, the liability of the bureau on account of accrued leave will, for at least two years longer, be comparatively large, but during the next year employees who have been for three or more years in the service will begin to take their accrued leave, which will materially increase the expenses for salaries and wages, as such a condition necessitates the employment of extra employees to perform the work of those absent on leave.

While the quarters on the third floor of the Oriente building have been found adequate, the increase in the force for the coming year will necessitate the addition of at least two rooms; and as several on the same floor have been vacant during the past year, it is anticipated that they will be assigned to this bureau.

The lack of proper vault space in the building for the safe-keeping of land documents and records of surveys was the cause of the request to the bureau of public works for the preparation of plans and estimates for a vault, to be submitted to the consideration of the Philippine Commission, and it is urgently recommended that an appropriation be made for this purpose, as the loss of the records of survey would necessitate resurveys costing hundreds of thousands of pesos.

There are stated hereafter, under the different natural subdivisions of the work, an account of work accomplished during the year, recommendations relative thereto, and a statement of the finances of the bureau, subdivided as follows: Friar lands, public lands, surveying and drafting, San Lazaro estate, and financial statement.*

* Financial statement has been omitted and filed in the Bureau of Insular Affairs, War Department.

FRIAR LANDS.

The organization effected during the fiscal year 1906 for the administration of the friar lands has been found sufficient, and no material changes have been made during the year. An experiment was made by replacing an American agent on one of the estates by a Filipino who came to the bureau well recommended. After some months, during which nothing was accomplished on this estate except a reduction of the cost of administration, the agent was found, by the auditor's examiner, to have committed certain irregularities through negligence or ignorance, and therefore it became necessary to discharge him from the service. As a result of this experience and the irregularities of a minor nature committed by native clerks, the conclusion has been reached that it would be unwise to make further attempts in this direction, except by the use of native employees who have had the benefit of a long course of training in the friar land offices, shown marked ability and activity in the work, and whose integrity and honesty have been established beyond question.

The work of the administration of these estates has been hampered and the progress and welfare of the tenants materially retarded by political agitation conducted by those seeking the advancement of their own interest. The prejudices of the people and the arguments which were heretofore used to incite people to insurrection have been used by politicians. A topic which has never failed to secure the attention and hold the interest has been the assurance that the coming assembly would deliver over the friar lands to the occupants, the rightful owners of the same, free of all cost. Such assurances caused tenants to withhold their rents or delay making formal leases with the government. Still more incredible, but nevertheless a fact, tenants have been led to believe on some estates that a war between the United States and Japan was imminent, that the Japanese would take possession of the islands, and that if the payment of rent was delayed it might be evaded altogether. Aside from this is the continual agitation for the reduction of the rates of rental and exemption from payments of rents on nonproductive lands, and other similar questions which have formed live issues during the political campaign now coming to a close. But notwithstanding the retarding of the work by political agitation, considerable progress has been made.

It may be stated that the major portion of all estates devoted to rice culture is now occupied and leased, but that portion formerly devoted to the cultivation of sugar is practically abandoned, owing to the following conditions: (1) The lands are covered with stands of madre cacao or cogon grass of more than ten years' growth, which would necessitate an expenditure of from 20 to 100 pesos per hectare for clearing; (2) the former occupants have not even enough animals to cultivate their rice holdings, and therefore can not begin work on sugar lands; (3) mills, warehouses, machinery, and employees' houses were burned or are in such a state of repair that the owners can not, in the present condition of their finances, place them in condition for use; (4) agriculturists have not sufficient funds wherewith to plant and cultivate the sugar crop and are unable to borrow except at excessive rates of interest. Some of these conditions this bureau is endeavoring to rectify, as will be shown herein.

Many difficulties have been encountered in the administration of the friar lands estates through the decisions of the justices of the peace where there have been questions relative to the actual, bona-fide occupants in possession of said lands at the date of purchase by the Government. These matters have now reached such a critical stage that it is deemed of sufficient importance to take the questions up in a special report, as the cases are fast accumulating where apparent injustice has been done to the poorer class of occupants who are unable to appeal their cases to the higher courts.

All the friar estates have now been registered under the mortgage law in the respective provinces where located. San José estate has been registered under the Torrens act and a certificate issued therefor. Matamo, San Marcos, and Dampol estates are now before the court of land registration pending the action of the court, and other estates will be entered as fast as the surveys are completed and the information at hand with which the attorneys can file application for registration.

The following statement shows the progress on each estate, the current expenses, the receipts, and nonrecurrent expenses during the year, with a statement showing the deficit which has resulted to June 30, 1907:

STATEMENT SHOWING PROGRESS OF PRIAR LAND ESTATES DURING FISCAL YEAR 1907.

Name of estate.	Percentage of area to June 30, 1907.				Leases June 30, 1907.		
	Area purchased.	Estimated occupied.	Surveyed.	Leased one-year leases.	Number.	Area covered.	Annual rental contracted for.
	<i>Hectares.</i>					<i>Hectares.</i>	
Banilad.....	1,925	70	100.0	37.7	786	727	P4,083.12
Binebag.....	295	60	100.0	58.5	196	172	718.96
Bifan.....	3,659	60	100.0	57.0	1,851	2,066	20,041.04
Calamba.....	13,673	25	49.5	15.0	1,449	2,063	17,822.18
Dampol.....	929	100	100.0	100.0	311	929	4,222.04
Guiguinto.....	946	94	100.0	89.4	440	946	5,865.84
Inus.....	18,243	39	63.7	24.4	3,548	4,446	27,857.46
Isabela.....	19,891	1	100.0	0.5	60	79	586.12
Izombay.....	5,178	60	68.3	40.0	1,886	2,076	13,639.63
Malina.....	3,574	70	100.0	61.3	961	2,192	12,576.42
Matano.....	12	100	100.0	100.0	1	12	68.00
Muntinlupa.....	2,827	54	99.9	46.4	429	1,313	2,901.22
Naic.....	7,624	40	100.0	35.8	1,141	2,732	24,523.86
Orion.....	8,816	50	100.0	74.0	403	660	4,863.68
Pangasinan.....	11,440	25	None.	22.9	458	901	4,622.34
Piedra.....	23,265	40	100.0	27.9	1,528	3,197	28,707.32
San Francisco de Malabon.....	1,449	None.	100.0	None.	None.	2,000.02	10,389.07
San Jose.....	87	100	100.0	100.0	1	87	2,374.00
San Marcos.....	9,795	20	None.	15.9	983	1,556	11,346.40
Santa Cruz de Malabon.....	10,842	50	100.0	38.2	2,128	3,956	21,125.43
Santa Maria de Pandi.....	5,470	70	100.0	67.0	1,356	3,663	26,140.02
Santa Rosa.....	6,698	29	None.	8.0	350	537	3,151.04
Tala.....	8,020	80	None.	19.8	2,065	1,590	10,404.18
Talisay.....							
Twenty-three estates.....	156,677	32	60.1	22.6	22,229	35,832	241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86
							4,863.68
							4,622.34
							28,707.32
							10,389.07
							2,374.00
							11,346.40
							21,125.43
							26,140.02
							3,151.04
							10,404.18
							241,987.24
							P4,083.12
							718.96
							20,041.04
							17,822.18
							4,222.04
							5,865.84
							27,857.46
							586.12
							13,639.63
							12,576.42
							68.00
							2,901.22
							24,523.86

STATEMENT SHOWING PROGRESS OF PRIAR LAND ESTATES DURING FISCAL YEAR 1907—Continued.

Name of estate.	Annual interest on purchase price at 4 per cent.	Expenses fiscal year 1907.			Total current expenses.	Deficit fiscal year 1907.	Extraordinary nonrecurrent expenses, fiscal year 1907.		
		Account expenses administration.	Account expenses irrigation.	Account expenses irrigation.			Account surveying.	Account irrigation.	Total.
Banilad.....	P 8,479.99	P 1,404.43			P 9,884.41	P 5,881.11	P 11,866.82		P 11,866.82
Binagbag.....	1,434.91	596.83			2,031.74	1,312.78	2,638.70		2,638.70
Bilan.....	24,063.33	3,748.66	P 3,149.24		30,961.23	11,916.57	10,311.81		10,311.81
Calamba.....	55,417.73	8,706.78	1,620.76		66,746.26	48,867.18	19,962.20		19,962.20
Dampol.....	6,025.90	940.17			7,016.07	2,824.39	1,834.21		1,834.21
Guiguinto.....	6,222.72	1,404.12			7,626.84	1,827.14	1,236.42		1,236.42
Imus.....	82,890.97	11,669.35	4,005.15		98,465.47	68,549.61	22,958.60		22,958.60
Isabela.....	12,788.64	3,205.26			15,993.90	14,352.80	10,349.35		10,349.35
Lolombay.....	38,929.65	6,157.23	49.60		44,116.48	27,592.31	18,828.46		18,828.46
Malinta.....	17,616.85	3,247.90			20,864.75	9,718.47	18,783.31		18,783.31
Matamo.....	67.29	77.29			144.58	76.58	54.58		54.58
Muntinlupa.....	3,507.08	649.43	346.70		4,503.21	3,580.12	5,706.08		5,706.08
Nalc.....	39,308.46	7,626.57	1,268.12		48,203.15	20,594.57	13,606.92		13,606.92
Orion.....	3,722.01	1,254.04			5,016.05	841.79	6,469.89		6,469.89
Piedad.....	13,713.74	2,494.75			15,648.49	11,053.15	6,689.73		6,689.73
San Francisco de Malabon.....	42,794.99	6,896.24	1,488.87		50,124.10	38,631.03	19,025.77	P 6,996.18	26,021.95
San José.....	23,802.57	1,577.52			25,380.09	23,628.09	156.47		156.47
San Marcos.....	41,432.99	5,555.80	2,774.58		49,763.37	38,304.40	2,109.11	6,721.64	9,190.75
Santa Cruz de Malabon.....	43,185.40	5,594.65			48,780.05	29,806.30	16,494.18		16,494.18
Santa Maria de Pundit.....	32,406.49	5,690.65			38,097.14	27,883.46	16,975.00		16,975.00
Santa Rosa.....	3,944.39	1,671.19	2,323.71		7,939.29	7,743.88	1,565.65		1,565.65
Tala.....	8,994.36	1,671.19			10,665.54	7,743.88	1,565.65		1,565.65
Talisy.....	44,311.45	7,384.39			51,695.87	41,641.87	1,942.75		1,942.75
Twenty-three estates.....	554,437.02	85,620.09	17,026.67		657,083.78	430,465.15	206,499.19	13,861.96	220,361.14

Comparison of the above statement with the statement submitted in the last annual report shows an increase of 3,459 leases, covering an area of 6,207 hectares, with an increased contracted rental of ₱36,051.77, and increased revenues for the year of ₱127,966.33, while the cost of administration during the year was ₱85,620.09, and shows an increase of ₱1,964.79 over the same expense for the fiscal year 1906. The expenses on account of irrigation, however, show an increase of ₱11,006.52 over those for the year 1906, due to the employment of ditch tenders and laborers throughout the year for the maintenance of the irrigation systems. The expenses of surveying during the year were ₱206,489.18, as against ₱83,564.63 during the previous fiscal year, caused by the fact that more surveyors were employed in order that the surveys might be completed as soon as possible, in accordance with the desire of the Philippine Commission. The repairs on certain irrigation works on these estates resulted in an expense of ₱13,861.96. It is probable that during the coming fiscal year the expense of administration may be somewhat reduced, while that of irrigation will remain practically the same. The extraordinary or nonrecurrent expenses for surveying and drafting will be increased during the year, but it is expected to terminate the work of surveying at the end of the fiscal year.

In the last annual report mention was made of a certain lot situated in the town of Santa Rosa, which the Philippine-Sugar Estates Development Company (Limited) claimed had been sold to Mr. A. Kauffman during the month of July, 1903, and was not excluded either in the preliminary contract or the deed of sale of the Santa Rosa estate. The proposition made by this bureau relative to this lot was not accepted by the company, which finally acknowledged that the proposed sale to Mr. Kauffman had not been carried out with all the legal formalities usual in the transfer of real estate, and withdrew all of its claims to this piece of property.

The controversy over the lot adjoining the casa-hacienda, fronting on the plaza in the town of Santa Rosa, has not yet been disposed of. The matter was referred to the attorneys for the government for investigation and report, and it was their opinion that the contention of the municipal authorities was substantiated by the facts. As a consequence of this report the Philippine Sugar Estates Development Company (Limited) was notified that this plot of ground was considered a portion of the lands conveyed to the government and must be excluded from the tract reserved by the company, and until such exclusion was made no survey of their tract would be approved by this bureau. To this notification the company replied that it reserved the right to take the matter before higher competent authorities. Here the matter has rested for many months, the municipality in the meantime using such portions of the land as it deemed necessary. This bureau has undertaken a compromise in this matter which it is hoped to reach in the near future, as the company has evinced a disposition to modify its demands, and now seems willing to take only that portion directly in front of the main entrance to the casa-hacienda.

In relation to the Calamba machinery case, mention of which was made in the last annual report as having been referred to the attorneys for the government for action, it is understood that an attempt was made to reach a settlement, but without success. On October 13, 1906, a suit was filed in the court of first instance of Manila against the company, seeking the recovery of ₱50,000 as liquidated damages for the removal of the six sugar mills in controversy. Hearing in this case has not been had, but it is anticipated that the matter will be brought to trial during the next few months. The contention of the government is based upon the fact that these mills were specifically mentioned in the negotiations held just prior to the execution of the preliminary contract covering this estate, and further, that the said mills were not specifically excluded in the deed of sale executed in favor of the government, as was done in the case of other estates where lands or improvements were reserved for the company. The contention of the company will, in all probability, be that these mills were excluded by mutual understanding and agreement from both the contract and the deed of sale, and they will exhibit rough, type-written drafts of such instruments, with certain words crossed out, in support of such contention. However, while this may seem plausible, it does not explain the circumstances of bringing these improvements into consideration when the value of the estate was under discussion, and the failure to expressly exclude this machinery in the deed of this estate as in other cases, particularly in view of the facts that these mills were never located on lots reserved by the company.

No change in the status of the Malinta land claims, wherein Maria Serrano and others claim portions of the Malinta estate, has occurred. However, it is expected shortly to make application for registration of the Malinta estate before the court of land registration, the survey having been completed, and naturally these cases will be brought up during the hearing for the registration of this property.

During the year past one Eulalia Bagtas has filed with the court of land registration application for the registration of a tract of land situated in the Orion estate in the Province of Bataan. An investigation demonstrated that this land lay wholly within the estate and immediately upon the notification of these facts the case was referred to the attorneys for the government and a request made to enter opposition, which was accordingly done. Thereafter the case was set for hearing, but before the day of the trial the applicant filed a motion for postponement, acquiesced in by the government's attorneys. Apparently the attorneys for the applicant deemed it advisable to desist, since no new date for hearing has been announced, notwithstanding that it has been several months since the date first set for trial, and the attorneys for the government have advised this bureau to allow the matter to rest until such time as application is made for registration of this estate before the court of land registration.

TEMPORARY LEASES.

As explained in the last annual report, in executing temporary leases the object was primarily to secure an acknowledgment of title by the occupants, by reason of a lack of data it became necessary to accept the statement of each prospective lessee, not only as to the number of parcels by him occupied but also as to the area of such parcels. Temporary leases have been executed for a period of but one year on the basis mentioned above, and whenever the survey has progressed to such an extent as to admit of so doing the old leases have been recalled and others executed in place thereof. In many instances it has not been possible, even after the field work of the surveyor has been completed, to secure the exact areas, but computations of them have been made with the planometer which are within 5 per cent of the exact area, and they have been used in the execution of the new leases. By this method it has been possible to make an improved showing in the leased area on several of the estates, and during the coming year much progress should be made along these lines and the exact areas of a number of the estates should be known. Great difficulty has been experienced in securing the execution of the new leases in lieu of the old, owing to the fact that in almost every instance an increase in area has been called for and a corresponding increase in the annual rental has resulted. In many cases the new areas have been double those originally declared, and the report has been freely circulated that the bureau has increased the rates of rental. This report has been generally believed by the more ignorant, and by many who should know otherwise. This charge of increase in rental has been made by tenants who in reality are well informed to the contrary, and who have charged that the surveys were inaccurate, but when they were brought face to face with the facts have grudgingly admitted that the surveys might possibly be exact, but, as they did not cultivate a certain portion of their land, they should not, therefore, be required to pay rent therefor. Naturally it is wasted effort to endeavor to convince one who knows the truth but is determined to evade the same on some pretext or other, and gathers a following and gives importance to his complaints by circulating false reports among the less enlightened for the purpose of gaining support and adherence. A concrete example of the foregoing general statement is furnished in the San Francisco de Malabon estate, where there are a large number of lessees who, for the last twelve months, have steadfastly refused to execute new leases by reason of the increase in area and rentals. An offer was made by this bureau to endeavor to obtain an extension of the period in which they could pay their rentals on lands leased but not cultivated, which has since received the sanction of the secretary of the Interior, but up to date none of the tenants have endeavored to take advantage of this offer, and unless they adopt a different attitude in the immediate future and evince some disposition to comply with their obligations, this bureau will have no other recourse than to begin suits for ejection from the premises. It is not the holders of the smaller tracts of land who have thus refused to re-lease, but, as a rule, those holding large areas and a large portion of the cultivable land, and who work the same only on shares. It was believed a year ago that the issuance of permanent leases might be dispensed with entirely on most of the estates, and that the bureau could proceed immediately

to the issuance of sales certificates. Events of the last year, nowever, raised serious doubts as to whether it will be feasible so to do. In certain instances, where it was proposed to commence the issuance of sales certificates as a preliminary thereto, notice was issued that all rentals must be paid to a given date, but the tenants so strongly objected to the enforcement of this demand and have laid such stress on their impoverished condition and the hardship which would be imposed upon them by such action, which facts they have in a measure substantiated, that it was deemed advisable not to attempt to proceed with the sale at that time as such proceedings seemed but to invite failure.

In view of the fact that the total contracted rental in most instances does not equal the amount of annual interest accruing on the purchase value of any estate, that the payment of even this reduced sum is considered in the light of a hardship, and that in the event of the issuance of sales certificates not only would one-tenth of the full value of the land become due and payable annually, but in addition thereto 4 per cent on deferred payments, which would amount to more than is to-day paid as rental for the land, the advisability of disposing of other than small town and barrio lots and small tracts of agricultural lands of insignificant areas is a matter of considerable speculation and uncertainty. Patience is no doubt put to a serious trial when a tenant will insist on immediate sale to him of the land he occupies and, in the same breath, lament his inability to pay the exorbitant rentals now asked, yet these are the pretensions of not a few, among whom are generally the most influential people of the several communities.

It is my opinion that it will be absolutely impossible, except on a few of the smaller estates, to carry out the provisions of act No. 1120, by selling parcels of land on these estates on the basis of ten annual payments, with interest at 4 per cent per annum on deferred payments, as such a contract with the occupant means that he will have to pay from four to six times the amount he is now paying as rent. It is therefore urgently recommended that an amendment to act No. 1120 be enacted extending the time of payment to thirty years, which, under the provisions of the act, will permit this bureau to make contracts with tenants to suit their finances, thirty years to be the maximum time for payment for any parcel of land, deferred payments to bear interest at the same rate as now provided, 4 per cent per annum. While this increases the total interest to be paid by the tenant, it gives him an opportunity to reduce his annual payment to an amount that, with his resources from the sale of the crops from his land, he should be able to meet. Even on this basis the annual payment per hectare will average almost double the annual rent now charged per hectare. Thus, an occupant purchasing a hectare of ground, the value of which is ₱150, would be compelled to pay ₱5 per annum capital, plus the interest for the first year on the deferred payment, ₱5.80, or a total of ₱10.80, whereas the same occupant is now paying in no case to exceed ₱10, and in many cases not to exceed ₱4.

An attempt has been made to estimate the approximate amounts of readily salable land on each estate, with the following results (stated in percentages of areas): San José and Isabela estates (practically unoccupied), none; Tala estate, 50; Calamba estate, 60; Naic, San Francisco de Malabon, Imus and Santa Cruz de Malabon estates, 70; Piedad estate, 75; Binagbag, Banilad, Talisay and Pandi estates, 80; Orion, Malinta, and Lolombo estates, 90; Bifan and Santa Rosa estates, 95, and Matamo, San Marcos, Dampol, Guiguinto, and Muntinlupa estates, 100 per cent.

The sale value of all the estates, excluding the improvements—irrigation systems and the buildings—aggregated June 30, 1907, ₱14,337,400, while the estimate of the aggregate values of the salable land on the same date was ₱10,239,500, indicating that there are approximately ₱4,000,000 invested in land, and ₱1,000,000—the estimated value of the irrigation system and other improvements—in improvements, which, for some time to come, will neither be sold nor produce any great amount of revenue, but which annually costs at least ₱200,000 as interest on the bonds issued.

THE EXTENSION OF THE CULTIVATED AREAS ON ESTATES.

While the cultivated areas on the occupied estates are being continually increased, the process is a very slow one, owing to the lack of capital of the occupant for the purchase of draft animals, seed, farming implements, and machinery, and I believe that, under ordinary conditions, as a conservative estimate, ten years must elapse before as great an area of these estates is put under cultivation as was cultivated prior to the insurrection—say, in 1895.

Some extraordinary stimulus is necessary in order to obtain an extension of the cultivated areas on friar estates, especially on those estates where formerly sugar cane was cultivated to a large extent, the estates located in Cavite and Laguna provinces, where it is estimated there were from 20 to 25,000 hectares producing sugar cane under the friars' administration. This bureau having this condition under consideration, recommended to the secretary of the interior, for the purpose of extending the areas under cultivation, a scheme for the loan to bona fide tenants of funds for the purpose of cultivating their lands, and a committee, consisting of the insular auditor, the director of agriculture, and the director of lands, was directed by resolution of the Philippine Commission to prepare such an act and submit their recommendations thereon, which were favorable. The matter was referred to the attorney-general, who saw no legal objection to the investment of the surplus fund or the sinking fund pertaining to friar lands in mortgages covering growing crops and salable commodities manufactured therefrom, work animals, warehouses, mill houses, and machinery, and other property, both real and personal, situated upon the so-called friar estates. This act provided that the maximum amount advanced on growing crops should not exceed ₱100 per hectare, and regulations were prepared which would limit the advancement of this ₱100 as the work in the cultivation of the crops proceeded. For instance, on the sugar crop, it was proposed to make advances as follows:

Clearing of the land, fuel for the plow, transportation of water for the plow, and common labor during plowing, not to exceed ₱5 per hectare, advanced after land is plowed.

Planting, including cost of puntas, ₱10 per hectare, advanced when planting is done.

Cultivation, ₱20 per hectare, to be advanced as each stage of the cultivation is finished.

Harvesting and transportation to mill, ₱25 per hectare, to be advanced when the crop is cut and delivered at the mill.

Milling, boiling, transportation, and other expenses incident to marketing, ₱40 per hectare, to be advanced after the work is accomplished.

Total, ₱100 per hectare.

The above amounts to be paid on presentation to the agent of pay rolls, vouchers, etc., who before payment must investigate and certify that the work had been accomplished.

For the purpose of repairing machinery, mill houses, warehouses, and other buildings, it was proposed to loan not more than 30 per cent of the value thereof, to be advanced upon the completion of repairs. For the purpose of purchasing work animals, not more than 50 per cent of the total value thereof, to be advanced after the purchase is made; and where the tenants had other property, personal or real, unincumbered, it was proposed to grant loans to them on their property of not to exceed 50 per cent of its value. It was proposed to charge 10 per cent per annum for such loans, of which it was estimated that not to exceed 4 per cent would be expended on the administration, 2 per cent to be set aside to cover any losses that might accrue, and 4 per cent to be paid to the sinking fund as interest upon the capital invested. The act proposed included such safeguards as appeared necessary and left to the secretary of the interior and the secretary of finance and justice the regulations under which the loans would be made. This act has been submitted to a number of tenants on the various estates, especially where formerly the cultivation of sugar was the principal industry of the people, and has met with their general approval, although some of the more radical believe the act is not sufficiently liberal to advance the interest of the cultivator to such an extent as they would desire. However, through conversation with some of the most important tenants, assurances have been given that the passage of this act would be of great assistance to them, and they could begin immediately the cultivation of lands which have lain fallow for more than ten years. In the original act it is proposed to begin this system of loans on the Santa Rosa estate in Laguna Province and to extend it if the experiment prove successful, but it is believed that, with careful administration, a large area of sugar land, both in Cavite and Laguna provinces, now lying fallow, would begin to produce crops within eighteen months if this proposed act were to become law. It is anticipated that very few additional employees would be needed in this bureau to carry out this law. It is estimated that there remains in the surplus fund from the purchase of friar-lands bonds more than ₱1,000,000 which would be available for such loans.

IMPROVEMENTS ON THE ESTATES.

By reason of the large expenditures for surveying, drafting, and administration of the friar lands, it was not deemed essential in the last estimate submitted to ask for funds wherewith to make repairs on the buildings pertaining to the friar lands, and therefore practically no repairs have been made, the only exception being the building located at Biñan, Laguna Province, where a small sum was expended in repairing the roof. The buildings at Lolomboy, Bulacan, and Calamba, Laguna Province, are badly in need of repairs, the old tile roofing being in a dilapidated condition, leaky, and in some places unsafe, and should be replaced in each case with galvanized iron. Many doors and windows should be replaced and the walls repaired, but to accomplish this work satisfactorily would necessitate the expenditure of several thousands of dollars. The buildings at Imus and Naic, in Cavite Province, have been occupied by the military authorities throughout the year, and the rent paid has sufficed to meet the amount of interest accruing on the capital invested in each case. The leases entered into with the military authorities provided that all repairs necessary should be made by them, and this stipulation has been complied with. Notwithstanding the fact that the matter of the disposition of these buildings has been carefully considered during the past year, as yet no feasible solution has been reached and no recommendations are made. The buildings are eminently adapted to the purposes for which intended and to which at present devoted; but as for general purposes no demand exists therefor, as only business enterprises backed by large capital and transacting business on a large scale would be justified in either investing in such buildings or in leasing same. The building at Talisay, Cebu Province, is not such a structure as those to which reference has heretofore been made, but was formerly a residence and purchased by the friars. A portion of this building was found to have been demolished and the materials removed. The municipality of Talisay offered to lease the same for school purposes at the rate of ₱25 per annum. This offer, however, is so far below the price which should be paid therefor, that, rather than encumber the property for a given period of time, the offer was rejected. It is significant, however, in estimating the present market value of such property.

Under the heading of "improvements" in the Villegas estimate of the value of the friar lands were found items of ₱5,000 each for improvements on the Malinta, Piedad, and Tala estates. Diligent search for these improvements has failed to develop other than a quantity of building stone found in the walls of ruined hacienda buildings, and it was presumed that these were the "improvements" to which reference was made. If this be so, ₱15,000 worth of improvements which were purchased must be stricken from the assets of the friar lands, as they are of no value whatever.

IRRIGATION.

The irrigation systems on the different estates have received the attention of this bureau and the bureau of public works. An appropriation was obtained of ₱25,000 for reconstruction of the irrigation works on the estates of Laguna and Cavite provinces, and this amount has been expended under the direction of the director of public works with the approval of this bureau. Details of this work have not yet been received by this bureau, but it is known that the irrigation systems on all the estates are now in fair condition of repair and are furnishing all the water that is required. However, it is deemed advisable during the coming year to make extensive repairs to many of the dams and tunnels, and an estimate has been prepared and submitted to the extent of ₱60,000 for this work, which, when expended, should put the irrigation systems in such condition as will make further expensive repairs unnecessary for some years to come. As soon as the surveys have been completed on the friar lands, it is proposed to make accurate surveys of these irrigation systems for future reference and possibilities. The actual area irrigated is as yet unknown. The contours and levels have never been taken, and no data are at hand with reference thereto. Many of the old ditches which were closed have been reopened and are in working order, but an extensive study by a qualified engineer will be necessary before these systems may be fully developed along scientific lines.

The bureau employs an American superintendent of irrigation, 7 foremen, and 30 laborers in the repair and upkeep of the irrigation systems and the distribution of water, the minor repairs being made by this force.

No attempt has been made to charge for the use of water from the irrigation systems, nor was it considered advisable so to do until such time as the areas of each person's holding on the estates are known. Thereafter it is believed that regulations can be prepared and fees collected which will be sufficient for maintaining the irrigation and provide for the interest and sinking fund on the capital invested, without great objection from the users of the water.

RAILROADS.

A new feature which will tend to enhance the value of lands included in many of the friar estates is the construction of railways, which is now progressing to such an extent that the embankments are nearly completed. These railroads cross the following estates: Muntinlupa, Biñan, Santa Rosa, and Calamba, in Laguna Province; and Imus, San Francisco de Malabon, Santa Cruz de Malabon, and Naic, in Cavite Province; and both the estates in Cebu Province. To what extent the railroads will assist in extending the cultivated areas of these estates it is impossible to estimate, but that they will furnish much needed facilities for transportation of crops to market and will open portions of the estates heretofore inaccessible are apparent. The railroad companies have entered into an agreement with this office and taken possession of these lands with the understanding that they are to pay for same as provided in the friar lands act, and they have already settled with the tenants of many estates for the damage done to the improvements on the land taken.

CONDITIONS ON THE VARIOUS ESTATES.

Banilad.—While a considerable number of leases have been executed for lands, showing an increased leased area and corresponding rental, it may be said that on the whole the conditions have not changed materially.

During the past fiscal year, however, this estate has been surveyed, and it will be but a short time until the true area and class of each holding will be known. Once this information is at hand it will be possible to execute new leases, incorporating therein the true area of each parcel and securing returns in accordance therewith. The collections during the past year have practically equaled the contracting rental. It has been believed from the beginning that the areas of most parcels, as declared by the tenants, were less than one-half of what they in reality contained. But, notwithstanding this belief, it was not possible to undertake the correction of such discrepancies until the lands were surveyed. The survey is now practically ready and it is confidently expected that while few new leases may be expected, the area under lease and the contracted rental therefor will more than double before the coming fiscal year has elapsed.

So far as agricultural conditions are concerned, no change in the same can be expected. This entire estate is composed of lands not highly favorable for agricultural pursuits, the soil being sandy and crops entirely dependent upon the rainfall, and the only commendable feature in regard to this estate consists in its location, taking in, as it does, a portion of the outskirts of the town of Cebu. The new railway from Cebu northward will cross this estate.

Binagbag.—The status of this estate from a financial point of view remains unchanged. The lands have been classified during the past year and considerable thereof found to be altogether worthless. But few new leases have been executed, for the reason that the limit had already been practically reached. No change in the incorrect areas expressed in the various leases has been made, owing to the fact that it was expected to issue sales certificates, and the amount involved did not seem to justify the time and expenditure for executing leases that were expected to be canceled at any moment. That sale certificates have not been issued may be attributed to an expressed inability of the tenants to purchase. The year last past, however, has been a comparatively prosperous one and it is hoped soon to realize the hopes expressed in the last report hereon.

Biñan.—Relatively speaking, this estate has not advanced any appreciable degree, and the outlook for the immediate future, from a financial point of view, can not be characterized as particularly bright.

While there can be no doubt but that the areas of the parcels heretofore leased have been understated, yet the discrepancy will not be found so great on this estate as on others, owing to the fact that old friar rent rolls were at hand for the purposes of reference. However, it may be assumed that the

leased area will increase by one-fourth during the coming fiscal year, the survey already having been completed. The lands now leased and under cultivation are rice lands exclusively, it may be said, although a few parcels have been planted with sugar cane. But there are not less than 1,500 hectares of sugar lands that lie idle to-day. No one will lease these lands by reason of the prevailing low market value of sugar, the lack of capital, and, above all, the lack of animals with which to till the soil.

Under normal conditions this estate should easily produce a revenue considerably in excess of the total charges accruing against the property, but the prevalence of disease among the work animals and the inability of the tenants to raise capital with which to engage in agricultural pursuits renders advancement a matter of considerable conjecture unless some adequate measure be adopted which will effectively remedy the depressing conditions now prevailing. The new railway from Manila to Batangas will cross this estate, and embankments therefor have been constructed.

Calamba.—Some progress has been made during the year last past, but taken on the whole the conditions can not but be considered extremely unsatisfactory. That the areas of parcels of rice lands have been greatly understated can not be doubted, but it has thus far been impossible to regulate this discrepancy. Again, the San Cristobal dam, which was washed out in 1896, furnished water for not less than 500 hectares of land which to-day figure as rice lands of the first class on paper, but which in reality have reverted to the class of lands which are non irrigable and in consequence produce a correspondingly reduced rental.

Furthermore, the Philippine Sugar Estates Development Company (Limited), reserved 800 hectares of sugar land in the immediate vicinity of the town of Calamba, convenient to the lake and in demand, therefore, by the natives. Those residents of Calamba who have been able to undertake the cultivation of sugar cane, and there are a number of such persons, have naturally elected to cultivate those lands lying almost at their doors. It is a matter of slight importance to one attempting to make a living whether or not he may purchase the land he cultivates, and particularly is this the case where the price he must expect to pay amounts to a figure representing to him affluence. It is of vital importance that his efforts be productive of the greatest possible returns wherewith to meet his present pressing needs; hence, under the prevailing agricultural depression, it is not surprising that sugar lands of the government lying farther away should be practically abandoned.

It would be but to invite future criticism for this bureau to make any prognostications of a favorable nature at this time, for it can not be doubted but that the Calamba estate will prove a millstone to the Friar-lands fund for some time to come. Government assistance will undoubtedly hasten the coming of better times, but even this measure can only be expected to alter conditions gradually. The Manila-Batangas Railway will cross this estate.

Dampol.—This estate has been surveyed, the lands classified, and its registration is now pending in the court of land registration. It was stated in the last annual report that these lands would be placed on sale during the early part of the past fiscal year. Pursuant to the aforementioned plan a notice was issued to the tenants that rent must be promptly paid in full, in order to commence the issuance of sales certificates to those who desired to purchase their holdings. This notice resulted only in the filing of a petition signed by all of the tenants holding agricultural lands requesting that they be given time within which to pay their rent, basing such request on the lack of animals, financial embarrassment, and agricultural depression. This entire estate being leased to the limit and the total contracted annual rental (the payment of which would occasion much hardship, it was claimed), amounting to approximately two-thirds of the amount of the annual interest on the capital invested, it was considered but a waste of time to endeavor to proceed with the issuance of sale certificates by virtue of which one-tenth of the value of the lands must be paid annually, together with the 4 per cent accruing on unpaid balances, amounting to even more than the present annual income. An entire year has been permitted to elapse in the hope that under auspicious circumstances the financial condition of the tenants would so far improve as to permit of their purchasing the lands. Now, a second attempt is to be made in the immediate future, and should this fail, there will be no recourse but to double the rates of rental, a remedy which has not been invoked heretofore by reason of the fact that the rates now in force approximate those charged in Friar times. Even the rates

now in force have been criticised, as a convention of municipal presidentes of Bulacan Province passed a resolution requesting their reduction, which was forwarded by the provincial board recommending favorable action by the executive.

Guiguinto.—That this estate has not been placed on sale may be attributed solely to the dissensions and disputes which have arisen between the holders of agricultural lands and the occupants of adjoining lots. These matters have been seized upon by certain individuals, and no small political capital has been made of them. This has occasioned extra work in both the settlement of disputes, wherever possible, and the additional time and labor required to alter surveys already made or to survey new holdings. This condition of affairs seems to be now past, and it is hoped to place this estate on sale in the immediate future, with the prospect of reasonable success. Should this attempt at sale be unsuccessful the rates of rental must be increased slightly, correct areas embodied in new leases, and the lands charged for in accordance with the classifications established heretofore by the committee performing this work.

Imus.—Relatively small progress has been made during the past year, owing to the fact that the major portion of the occupied lands had already been leased.

No data were obtainable whereby to regulate the leasing of lands in the beginning, but it is believed that the area represented in all leases does not exceed one-half of the land actually occupied. By reason of the lack of information, it has thus far been impracticable to correct these erroneous areas, but the survey has so far advanced that it is expected to increase both the leased area and annual contracted rental one-half during the coming year; possibly such increase may reach twice the figures stated. Were it not for disease among the work animals, the outlook would be fair, but the vast sections of sugar land remain practically untouched. A large tract of sugar land has been taken by Mr. Emilio Aguinaldo, who is now engaged in clearing the same preparatory to beginning its cultivation, and it is hoped that through this example set them the residents may be encouraged to make some great effort at advancement. If assistance were to be extended to them by the government, within a few years' time it is believed that fully one-half of the entire estate might again be placed under cultivation and become productive of a gratifying return in revenue from rentals alone.

The projected railway from Manila to Nalc will cross this estate.

Isabela.—Unless the government should deem it expedient to go into the colonization business, the annual deficit may safely be placed at the entire amount of the annual interest accruing on the bonds issued for the purchase of this property. The 53 leases executed up to the close of the fiscal year 1906 increased until the number reached 76 in all. This number represents the high-water mark for leases on this estate. At this time heavy floods occurred in the Cagayan Valley and the Isabela estate suffered therefrom, some tenants losing their crops entirely, while the crops of others were greatly damaged. The rent fell due on or about this same time, and so to escape their obligations a number of the tenants gathered together their few belongings and took their departure. However, there are still 60 tenants, occupying 79 hectares of land. Under the arrangement entered into whereby the provincial treasurer is to undertake the administration, it is hoped that the annual rental will suffice to defray the cost of administration, without increasing the annual deficit.

Of course there is the possibility of securing capitalists or corporations to undertake the exploitation of these lands, provided sufficient inducements be offered, but this is only problematical, owing to the fact that an abundance of public lands is available in this region, and to the further restrictions placed on corporate bodies owning real estate. The lands are excellent, suitable for diverse crops and especially for tobacco, but this may be said with equal truth regarding public lands in this vicinity.

Lolomboy.—Some slight progress has been made during the year, but the showing made is quite unfavorable and may be attributed in a large measure to the under-declaration of areas by the lessees, and the inability of this bureau to alter these figures because of lack of sufficient information for the purpose. The survey of this estate has so far progressed that it is anticipated that an increase of one-half, and possibly more, in the leased area and annual contracted rental will be secured during the coming fiscal year. It is believed, however, that even the increased area and consequent increased rental will not suffice for the purpose of defraying the annual charges accruing against this estate, and it is anticipated that the rates of rental must be increased. This action, if taken,

will undoubtedly precipitate a storm of criticism and opposition, but it is believed that such action would be entirely justifiable, taking into consideration the small returns secured from the lands. It is believed that the percentage of waste lands will be found greater than that given in the estimate, and that a considerable area will be found to be lands of an inferior quality. As the average price per hectare for lands of this estate is greatly in excess of the average price for similar lands on others, the prospect of reducing the annual deficit is not as great as in many other instances. There has been some slight shortage in the supply of water for irrigation during the past year, but repairs to the irrigation system are under way at the present time and the supply of water should, in the immediate future, become as great in volume as at any time in the past. While the tenants are handicapped by a scarcity of work animals, the shortage is probably less than on other estates.

Matinta.—During the past year notable progress has been made, as will be apparent by a comparison of the contracted annual rentals for the last and the preceding fiscal years. The survey of this estate has been completed and it is expected that the sale of these lands will be commenced during the coming fiscal year. Whether or not this sale may be realized is a matter of conjecture, owing to a lack of means on the part of the tenants; but even should an attempt at sale be unsuccessful it is safe to say that the amount of contracted rental will, during the coming year, reach a figure that will more than cover the total charges accruing against this estate.

Matamo.—It is believed that the sale of this estate may be realized during the coming fiscal year, notwithstanding the fact that it was not possible to dispose of the same during the past year, as was confidently expected.

Muntinlupa.—A marked improvement in the conditions prevailing may be noted, by a comparison of the figures for the past year with those for the fiscal year 1906. During the coming fiscal year the returns will be increased to a figure that will more than meet the total amount of charges accruing against the property. The lands of this entire estate, with the exception of approximately 150 hectares, are dependent entirely upon the rainfall, and the great bulk of the estate is composed of hill lands, most of the soil being sandy, and in some places quite rocky. The establishment of a government stock farm on this estate has encouraged the people to go further into the hills and undertake the cultivation of lands heretofore abandoned, as the presence of a government institution has given them the assurance of freedom from molestation by ladrones. In addition to this, quite a number of people have become interested in the cultivation of maguey, for which the lands are considered suitable, and as the average price per hectare for these lands is considered reasonable, several leases for tracts of land of 100 hectares each have been executed, and there are now on file a sufficient number of additional applications for lands to insure the leasing of this entire estate in the immediate future. The survey is nearing completion, and it is confidently expected to undertake the issuance of sale certificates during the coming year. Should it not be possible to dispose of these lands by sale, the annual rental will soon be sufficient to meet all charges. The Batangas railway will cross this estate.

Natc.—Quite a number of new leases have been executed for lands during the past year, but the increase in area leased and contracted annual rental has not been material. It may be considered that all of the rice lands, susceptible of irrigation, have been leased and are under cultivation. By reason of the fact that old rent rolls were available for reference at the time of executing leases of the lands, the discrepancy in the areas of parcels can not be so great as on many other estates, and it may be estimated that the increase in leased area, upon the completion of the surveys, will not be in excess of one-third of the area now stated. Inasmuch as the greater part of this estate is not under cultivation and has not been leased, the deficit amounts to considerable. In addition to this, the interest accruing on the purchase price for the irrigation system is in itself an item of expense which has not thus far been offset by a corresponding charge for the service rendered. The survey is well advanced and it will, ere long, be possible to correct leases now outstanding, and it is believed a material increase in revenue will be obtained. However, the lack of work animals is an insurmountable obstacle in the path of development of the sugar lands, of which this estate is largely composed. Should the government see fit to render the tenants some temporary financial aid, it may be that a sufficient area of the uncultivated portion of this estate might be placed under cultivation and a revenue therefrom secured sufficient to defray the annual charges accruing, but even this measure would not, it is thought, be

productive of the desired results during the first year. Extensive repairs have been made to irrigation structures during the past year, and it is believed that the supply of water for irrigation purposes is now a volume equal to the maximum supply ever before obtained. Some slight changes for the better in the rentals for rice lands may be anticipated as a result of the repairs to the irrigation system, but on the whole it is believed that the increase in revenue from these sources will not equal that which is anticipated on other estates. The projected Manila and Naic Railway will have its southern terminus on this estate.

Orion.—During the past year this small but comparatively prosperous estate has dropped back somewhat with respect to area leased and the revenue derived therefrom. These decreases have been occasioned by the relinquishment of sugar lands by the former occupants of the same. Several large tracts of sugar land were in the beginning leased by the former occupants, but after a year's trial they were again surrendered, for the reason that the lack of capital and animals made it impossible to work these lands, and, seeing no prospect of being able to do so in the near future, they deemed it advisable to discontinue paying rent therefor and relinquished all claims to the preference right of purchase at time of sale. The lands thus surrendered have not been re-leased by other persons, as the majority of the occupants are in the same financial condition as those who have surrendered the lands, and consequently will not undertake to cultivate or to assume any financial responsibility for the same. There is practically nothing which can be done now to remedy this condition of affairs. It is true that maguey or some similar crop might be grown on these lands to future advantage; but as returns therefrom can only be expected after a considerable lapse of time, there are but few who are financially able to undertake the cultivation of these crops, most people being engaged in growing such crops as will yield immediate returns with which to provide for their pressing needs.

Piedad.—The area and annual rental have practically doubled during the past year, owing almost entirely to the correction of the areas expressed in the leases first executed. Some few new leases have been executed during the year, but progress in this work has been very slow. Notwithstanding the fact that this estate lies within a very short distance of the city of Manila, and by reason of its location would seem to be in considerable demand, such is not at all the case. It is hilly almost throughout, and in the hollows lying between the various hills there are strips of land of great fertility upon which good crops of rice are grown. On the other hand, on the hillsides the depth of the soil is but slight, and on the hilltops it is even less. Again there are areas of land comparatively level or with a gentle slope upon which the bare rock shows above much of the surface, and only small pockets of earth are to be found. On lands of this character not even maguey may be successfully grown; hence quite a large number of hectares are absolutely worthless in so far as agriculture is concerned, and at this time there is no other purpose to which they might be devoted and for which a return might be obtainable. Although the boundary is not to exceed 5 miles distant from the city of Manila, the road leading out from the city is in an almost impassable condition for vehicles, and the marketing of the produce is an expensive and tiresome matter owing to difficulties of transportation. The shortage in work animals in this section is keenly felt, and there seems no prospect of materially lessening this shortage in the near future. The employment of modern machinery as a substitute for animals would not be possible on the greater part of this estate, by reason of the scantiness of the soil and the rocks which project above the surface on those parts which are comparatively level, and on the remaining portions by reason of the pitch of the land itself. While it is hoped to remedy to some extent this lamentable condition of affairs, the nature of the various obstacles is such that the future holds forth no great promise.

San Francisco de Malabon.—While a number of new leases have been executed for the lands during the past year, the progress made has been comparatively little compared with that anticipated. Owing to the fact that the survey has reached quite an advanced state, it is anticipated that a relatively satisfactory showing may be made ere the close of the coming fiscal year, but because of a lack of definite information it has not been possible to correct thus far the discrepancies in areas made at the time of executing the first temporary leases. Some of this work of correction has already been performed, and it has been found that in nearly every case not to exceed one-half of the land actually occupied was declared by the occupants of the same at the time of executing

the leases therefor. While it is anticipated that the contracted annual rental will be increased by several thousand pesos during the coming year, it is not expected that the same will reach a figure high enough to defray the interest charges and expenses of administration incurred. This conclusion is based upon the fact that the greater part of the lands are sugar lands which have been abandoned for years, are overgrown with rank vegetation, difficult and expensive to clear, upon the scarcity of work animals, and the lack of means and necessary capital on the part of the tenants. The irrigable lands may be said to be all taken up; and while the exact area of the same is not yet known, it will be in the near future, and this information will be embodied in the new leases for the same. During the year last past a large amount of money has been spent on the repair of the irrigation works, and there can be no complaint of a shortage of water for irrigation purposes. As a result of the surrender of Montalan, De Vega, and other leaders of the *ladrones* who hovered around the immediate vicinity, and particularly the first named, who is a native and former resident of San Francisco de Malabon, and whose family and relatives reside there at the present time, a feeling of comparative assurance is now felt, and many people are moving out into the *barrios* and erecting their houses along the main roadways where the same in former years stood. While in many instances these people are merely the employees of the larger landholders, or are working the lands of such tenants on shares, and no immediate benefit to the estate in the way of additional leases and increased areas and rentals may result therefrom, yet this fact evidences the beginning of more prosperous times for the lessees of the estate and the community in general, which will in turn result beneficially for the government, although at some later date. It is believed that steam plows could be used to advantage in the cultivation of the sugar lands; and were the government to lend the tenants temporary financial assistance, in the course of approximately two years it is believed that this estate might be placed on a comparatively satisfactory financial basis. If such assistance be not forthcoming, it is anticipated that considerable time must elapse ere this property becomes self-sustaining. The new railway from Manila to Naic will cross this estate, and construction work is progressing thereon.

San José de Mindoro.—During the past fiscal year the conditions prevailing have remained practically unchanged. No office has been established for the same reason as given in the last annual report, the absence of any considerable number of occupants; the fact that the expense for executing leases would be greater than the revenues for which contracts might be entered into, and the complete absence of any hope of securing people from elsewhere to take up portions of this estate. The arrangement previously entered into with the Recoleta Order of Friars for grazing privileges, whereby the sum of ₱0.20 per month is charged for each animal two years of age and over has been continued throughout the past year, and the only revenue derived from this estate has been obtained from this source. The agricultural possibilities of this estate can hardly be exaggerated. Experiments conducted with greatest care during the time of the Friars have demonstrated clearly that there is almost no crop grown in the Philippine Islands which can not successfully and profitably be grown on this estate. A large portion could be irrigated at small expense, as two large rivers with an abundant flow of water cross the estate and a number of smaller rivers have their source within the estate itself. The higher nonirrigable lands are particularly adapted to the growing of coconuts, abaca, maguay and many other profitable crops. A small quantity of tobacco was planted as an experiment, and those in a position to best judge of the matter feel assured that the returns which might be obtained from this crop would be exceptionally abundant in quantity, superior in quality, and profitable financially. While the cattle industry has proved to be a most flourishing and lucrative enterprise and the percentage of increase phenomenally high, the great fertility and exceptionally favorable nature of the conditions are such as to warrant the belief that the lands should not be devoted to cattle raising, by reason of their great adaptability to agricultural pursuits. Unless persons of considerable means, capitalists, or corporations can be induced to take up large holdings it is safe to predict that the same will remain practically in a state of abandonment for many years to come. This bureau would be able to offer tracts of land of almost any description desired, and under the most favorable conditions, to anyone desirous of engaging in agriculture or stock raising. These lands might be purchased outright or leased at a reduced rental for a term of three years, as desired.

San Marcos.—It was found impracticable to dispose of this small estate by sale during the year last past, as was confidently expected, but it is hoped that a similar attempt soon to be made will meet with more favorable results. Should it not be possible to dispose of the lands in this way, the contracted annual rental will be increased to a figure sufficient to pay all charges accruing against the property.

Santa Cruz de Malabon.—The progress made during the year last past has been relatively small. But few new leases have been executed, and for lack of necessary data it has not been possible to alter the figures shown in the leases executed for the lands—figures known to be extremely inaccurate. The survey having been recently commenced, it is expected that during the coming year the leased area and annual contracted rental will be increased very materially. The conditions prevailing are, in almost every respect, similar to those obtaining on the adjacent estate of San Francisco de Malabon, as regards the character of the lands, lack of capital, the dearth of work animals, and the prevalence of disease. The minor structures of the irrigation system have been repaired as far as possible, but several of the principal structures remain to be repaired during the coming year. It has not been possible to effect the repair of these larger dams during the year last past for the reason that it was of the utmost importance that attention be given the irrigation works on the San Francisco de Malabon estate, owing to the fact that a large proportion of the water for irrigation purposes used is secured from structures located on the San Francisco de Malabon estate, and it was therefore important that the source of supply receive attention first. As is the case on other estates in the province of Cavite, unless something be done to assist the occupants of this estate, the great bulk of these lands—sugar lands—will remain idle for a long time to come. The Manila-Naiv Railway will cross this estate.

Santa Maria de Pandi.—A considerable number of new leases have been executed for the lands of this estate during the past year, and a consequent increase in the leased area and contracted annual rental thereby secured. However, as has been noticed on all other estates where the bureau has had to depend entirely on the statements of the lessees as to the area and class of each parcel of land, it is believed that the area of the lands actually occupied is double the amount shown by the leases executed therefor. The lack of information and data to enable the correction of these discrepancies has necessitated the continuance in force of the leases as originally executed. The survey has now so far advanced that in the near future, upon the expiration of the present leases, it will be possible to discontinue the same and execute in lieu thereof new leases embodying relatively accurate areas, thereby securing a corresponding increase in the contracted annual rental. According to the Villegas estimate of this estate, all the lands are rice lands, the same being divided into 5 classes. This may be true, but if so, then it may be stated with equal truth that all cultivable land is rice land. So far as known there are but 11 small dams and 2 auxiliary or secondary structures. These are placed across the outlets of comparatively small catchment basins. With perhaps but two exceptions there is no running-water supply, and the main purpose sought by these structures is that of diverting the run-off of the rains. The greater part of this estate is rolling country, the height of the hills varying from 50 to 250 feet, and the lines of drainage are from within and toward the boundaries; thus the general slope of the country is opposed to the lines along which water must be brought if an attempt were to be made at securing water for irrigation purposes from the Angat or Santa Maria rivers. Were it not for the thousands of hectares of uncultivated land, uncultivated for the reason that the same has practically no value for agricultural purposes, estimated to be worth ₱25 per hectare in the Villegas estimate (and as the purchase price paid for this estate is over ₱200,000 in excess of said estimate it is reasonable to suppose that this estimated value was in nowise reduced), there would be entertained the hope of eliminating a deficit on account of this estate during the coming fiscal year; but under the circumstances no such optimistic view can be taken of the matter, and the most that can be said is that the deficit occasioned by recurring charges will be materially reduced. The lack of a sufficient number of work animals is somewhat of a handicap, but this shortage is not so great on this, or any other of the estates in Bulacan Province, as it is on those estates situated in other provinces.

Santa Rosa.—A number of new leases have been executed for lands during the past year, and the area thus leased, 1,000 hectares, is considered as being a very flattering showing. That the annual contracted rental has not seemingly

increased in the same ratio as the area is due to the fact that the lands leased are, for the most part, sugar lands, and the rates of rental asked for this kind of land are the lowest on the estate. During the year past an arrangement was entered into, with the approval of the secretary of the interior, whereby this bureau was authorized to reserve certain tracts of sugar lands and to suspend the collection of rentals therefrom until a crop had been raised thereon. The bureau of agriculture was authorized to furnish a steam plow and to do the work of plowing at actual cost, payment for such work to be made simultaneously with the payment of rent for the lands. Certain tenants on their part undertook to clear the lands thus reserved, grubbing out the trees, underbrush, and cogon with which these lands were covered and undertaking to furnish wood and water for the steam engine and such labor and assistance as might be required of them. The aforesaid arrangement was inaugurated with the greatest enthusiasm on the part of many tenants. Many unforeseen obstacles were encountered, and for a considerable length of time the results obtained were quite unsatisfactory and discouraging. Plows which had done satisfactory work in other lands here proved absolute failures, and but a limited number of hectares of land were plowed up to the time when it was no longer possible to put in a cane crop during the present calendar year, and work therefore was suspended. During this trying period the enthusiasm of the tenants waned and eventually died out, with but one notable exception. This man, the largest landholder, remained steadfast to the cause, did not for one moment cease in his endeavors to insure the success of the undertaking, and at no time hesitated in making any outlay necessary, regardless of the disheartening results obtained. The experiences of last season, however disheartening for the time being, have taught a lesson which has proved valuable indeed. The defects noted from time to time have been corrected and such alterations have been made as will accomplish the results desired. But a short time ago this plow was again placed in operation, breaking soil for planting cane during the coming year, and the results now obtained are most encouraging. Where but from 1 to 2 hectares were but indifferently plowed in a day during the past year the results at present obtained vary from 5 to 7 hectares per day of excellent work. As a consequence of this, interest has again revived, and it is confidently expected that from 300 to 500 hectares of sugar lands will be placed under cultivation this year. Notwithstanding the cheerful outlook for the betterment of the conditions during the coming year, it should be clearly borne in mind that the work of breaking up and plowing the land is but a preliminary step. After this land has been plowed and harrowed a large number of work animals will be required by the people in throwing up furrows preparatory to the planting of the cane and in cultivating the fields until such time as the cane reaches a height which will prevent further cultivation by plowing. In the planting of cane a large number of laborers must be hired and paid in cash, and a considerable expense is incurred by the planter. After the cane has reached a certain height it is necessary to cultivate between the rows by hand, which is another item of expense. The harvesting of the cane, cartage of the same to the mill, and subsequent conversion into sugar are each items necessitating heavy outlays on the part of the sugar planter. The result of a season's work can not be realized immediately, but a certain period of time must elapse before the sugar can be disposed of in the market. As previously stated, the preliminary step, that of plowing, may be considered as successfully taken and an accomplished fact, but the tenants lack the necessary work animals and capital to prosecute this work thereafter. It was with this end in view that this bureau submitted to the Philippine Commission for consideration a proposal for loaning money to these tenants in order to enable them to carry on to a successful termination the work heretofore begun. Should this proposal be rejected, it is almost an assured fact that these people will be unable to raise funds for this purpose elsewhere, in view of the fact that they are but the lessees of the land and can not pledge the same, and this would be the guaranty demanded by anyone who might contemplate advancing the necessary funds. The establishment of the agricultural bank would in nowise benefit tenants of the friar estates, for the reason above stated. The Manila-Batangas Railway will cross the estate and is already under construction.

Tala.—During the year last past practically the only advancement accomplished has been the result of the correction of the areas declared by lessees at the time of executing temporary leases. The drawbacks encountered are, to all intents and purposes, identical with the conditions prevailing on the Piedad estate, the only difference being that these lands are still more inaccessible than

those of the Piedad estate and consequently are in still less demand. Notwithstanding the fact that the heart of this estate is within 8 miles of the city of Manila, communication with the city is a matter of such difficulty that the expense for transporting agricultural products to the city renders the marketing of the same almost prohibitive. The lands are rolling and hilly for the most part, and only those portions lying in the hollows between hills are suitable for the cultivation of rice. In former times sugar cane was grown on the highlands and hilltops, but at present, on account of the lack of work animals and capital, they lie idle and abandoned, only about one-eighth of this entire estate being occupied. The population is very sparse. During the coming year a special effort will be made to improve the conditions on this, as well as on the Piedad estate, by the introduction of maguay and other crops which will flourish under adverse conditions and will require but a limited number of animals, and by endeavors to induce people from other localities to take up land here. An effort will likewise be made to have the main road leading from Manila to Novaliches placed in such a condition as to permit of the passage of vehicles, and it is believed that when this is accomplished a demand may be created for the lands.

Talisay-Minglanilla.—The work of leasing has progressed satisfactorily during the past year, as will be seen by the large number of leases executed. The total of collections will also be noted as amounting practically to the full amount of the contracted annual rental. Notwithstanding the fact that a large percentage of the lands will be shown to be valueless for agricultural purposes, the small leased area shown and the similarly small amount of contracted annual rental can not be attributed to these arid lands. As was the case on other estates, practically no definite information could be secured concerning the holdings, and for the purpose of executing temporary leases the bureau had to rely upon the statements of the lessees themselves. As customary elsewhere, the area of each parcel was declared by the prospective lessee as a given quantity of palay or corn (according to the amount of such grain requisite to seed the given area of ground). In this province there was and is a generally accepted table of equivalents, which has been used in years past and generally accepted, and while the same was believed from the very start to be absolutely inaccurate, the opposition encountered was so bitter that it was considered good policy to accept the table and make use of the same in reducing to the metric system the area of each parcel stated according thereto. On the Luzon estates a cavan of palay was considered as 2 balitas realengos (or 1 hectare, 15 ares, 51 centares), and this figure has been found to fall short of the actual area in almost every instance. In Cebu the area equivalent for 1 cavan of palay was estimated at but 67 ares and 8 centares, or about one-half that employed in Luzon, the consequence of which is that the areas leased are believed to be stated as only about one-third of the actual size, and the annual rental consequently approximately but one-third of what it should in reality be. Owing to the fact that no information was at hand which would justify a change in the areas so declared and to the bitter opposition which would have been encountered had the bureau attempted arbitrarily to raise the areas of the various parcels of land, no change has been made in the leases as originally executed and the same have been permitted to continue in force. The survey having now been undertaken, it is hoped that during the course of the coming year there will be a material increase in both the total area and total contracted annual rental, even though but comparatively few new leases be executed. There are known to be quite a number of people residing on this estate who have refused absolutely to execute leases for the lands occupied, and who assert that they are themselves the owners of their respective holdings. Application for the registration of this estate has been made to the court of land registration, with a view of determining the legality of these pretensions with the least delay practicable, and it is anticipated that considerable litigation over the lands must ensue in the near future. The residents are believed to be gradually recuperating from the effects of the drought, and consequent famine, which occurred in this section during the year 1905, at which time thousands of people from the country were forced into the city of Cebu and lived for a considerable period of time upon the charity of others residing in town, if assertions of credible witnesses are to be accepted. Notwithstanding a material increase in the contracted annual rental is expected for the coming year, it is anticipated that the deficit will still be quite large. The lands of this estate are dependent almost entirely on the rainfall, and while a portion of the estate is classed as rice lands and irrigable, the supply of water is not constant. The streams from which the water is secured for irrigation should properly be classed as wet-weather streams, notwithstanding the fact they are dignified with the name of river.

The exorbitant price paid for the lands is and will continue to be the main cause for the large deficit. Sugar lands of the first class, and lands suitable for the growing of corn, are stated in the Villegas estimate at ₱300 per hectare, and evidently were paid for at this figure, while sugar lands of the first class on the Calamba estate are valued at ₱60, on the Biñan estate at ₱100, and on the Santa Rosa estate at ₱150 per hectare, and the lands on the three estates last named are far superior in every way to similar lands on this estate. It is a matter of profound wonder how these figures were ever arrived at.

FRIAR LAND EXPENDITURES FISCAL YEAR 1908.

The following statement,^a showing the expenditures for the friar estates for the fiscal year 1907, and submitted in accordance with the provisions of the last appropriation bill, shows the expenditures on account of each estate, segregated under subheads, indicating the cause of the expense and summary of the same.

CLASSIFICATION OF ESTATES PREPARATORY TO SALE.

One of the most important steps to be taken in arriving at the sale value of the lands of an estate is the classification of each and every parcel of the same. Under the provisions of section 12, act No. 1120, the classification of the lands of an estate is not a mere perfunctory procedure, but, on the contrary, is a matter requiring careful consideration and painstaking investigation, since it is provided that the value of a parcel shall be arrived at by "taking into consideration the location and quality of each holding of land and any other circumstances giving it value."

It was originally proposed to delegate this work to a committee of three, to be composed as follows: An employee of the bureau of lands, an employee of the bureau of agriculture, while the third member was to be preferably a tenant of the estate to be classified, well versed in matters of agriculture and the local conditions to be encountered, and whose standing in the community was such as to preclude allegations of bias, favoritism, or lack of practical knowledge or experience. The organization of this committee, constituted in the manner above mentioned, could not be effected, owing to the inability of the bureau of agriculture to spare the services of a practical man. Thereupon it was suggested, and duly approved, that the lacking member be some prominent man residing in the province. Pursuant to this arrangement a committee was duly appointed, with Mr. Pablo Tecson, of Bulacan Province, as chairman, and the classification of the Dampol, Bingabag, and Guiguinto estates undertaken, in the order named. The work accomplished by this committee was of the highest order of excellence, and the results have surpassed even the most sanguine expectations, being most thorough, painstaking, conscientious, and equitable in character, and no item was considered as too insignificant to merit just attention. The plan has been so satisfactory in practice that it will be carried out on all estates.

PUBLIC LANDS.

The work in relation to public lands has been greatly increased, owing to a greater activity in the applications for public lands, due to the large amount of advertising, not only by this bureau, but by the employees of the bureaus of forestry, education, and constabulary, who have all contributed to the dissemination of knowledge relative to the public land law. This bureau, in addition to the distribution of over 20,000 circulars, has had three agents in the field for the larger part of the year explaining the laws, assisting applicants in preparing applications, inspecting the lands, and investigating contests. There have been 12,029 applications of various kinds filed for public lands, which may be compared with 3,392 filed prior to the beginning of this fiscal year, as follows:

Kind of application.	Fiscal year 1907.	Previous.	Total.
Homesteads.....	2,669	805	3,474
Free patents.....	8,607	730	9,337
Sales.....	86	82	168
Leases.....	12	10	22
Coal.....	136	150	286
Mineral.....	619	1,615	2,134
Total.....	12,029	3,392	15,421

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

Owing to the increase in the work, increased personnel has been necessary in the public lands division, and yet it has been impossible to keep current its work. It has also been found necessary to use the Spanish language in conducting the correspondence of the division, in a great measure, as explanations made in English relative to necessary corrections in public land applications are not generally understood, while by the use of the Spanish language the applicant can usually obtain a translation into the native dialect. A great majority of the public land applications are signed by a cross, indicating that the more ignorant Filipinos are making the majority of the land applications.

For the purpose of reporting upon the various methods of obtaining public lands, the following order will be observed: Homesteads, sales, leases, free patents, town sites, unperfected titles, coal lands, mining claims.

HOMESTEADS.

[CHAPTER I.—Public land act.]

During the fiscal year 2,669 homestead applications were received, while the total number on file June 30, 1907, was 3,474, covering an area of 38,963 hectares. Of this total number of entries, 748, covering an area of 9,290 hectares, have been allowed. The balance of the applications are in various stages of progress, as shown by the detailed statement relative to homestead applications attached hereto [on file at Bureau of Insular Affairs], which shows the rejection, cancellation, or withdrawal of 297, covering 3,257 hectares of land. There are also 350 applications, covering an area of 4,484 hectares, which are merely awaiting payment of the initial fee of ₱10 before being allowed. The total number of initial homestead entry fees received during the year was 818, amounting to ₱8,180. The total number of homestead initial entry fees liquidated and deposited to the credit of public lands was 598, amounting to ₱5,980.

The average area of a homestead, as shown by the applications on file, is a trifle over 11 hectares. As to homestead applications it may be stated that the filing of a homestead application does not, in every case, mean a bona fide intent on the part of the applicant to comply with the law, as reports have been received from agents of this bureau that homestead applications are being filed for parcels of land which the applicants, after one crop, dispose of to whomsoever will purchase same. In other cases it appears that applicants have filed homesteads for the purpose of cutting the timber, using their homestead applications as a means of defense to their right to cut timber when they had no intention of further complying with the law, and are not, therefore, bona fide homesteaders. Complaint has also reached this bureau that some applicants go so far as to use their homestead entries as roving commissions to cut valuable timber in the locality, and declare the timber, when brought to market, as having been cut on the land described in their homestead entries, when it is known to the forestry officials that the land entered by them contained no such timber. Many applicants have no idea that the law really means what it says regarding occupation and cultivation, or that, if they do not comply with the provisions of the law, they will ever be deprived of any portions of the lands they have entered. There is also a class of people who are locally influential who are reported as using the provisions of the homestead act to secure titles to larger tracts of land than permitted under the law. Their method is to require their aparceros, who are generally ignorant, to apply for the land under the homestead law. Such aparcerero does not know the purpose of the application; or if he did it would make no difference, as he is absolutely under the control of the cacique, who thus endeavors to gain, at some time in the future, an absolute title. That this is the practice there seems little doubt, but to prove it is very difficult. However, rigid investigations will be undertaken in suspicious cases of this nature and, in cases of sufficient evidence, prosecutions will follow.

The homestead law provides for an entry fee of ₱20. The average area of a homestead may be said to be 11 hectares. Basing the cost of surveys which the government makes free for all homesteads upon the average cost of surveying done by this bureau for the past year—₱3 per hectare—it may be seen that the average cost of surveying a homestead is upward of ₱30; and it is estimated that the average cost of the clerical work and investigation necessary during the five years before the entry can be allowed will make the cost to the government for each homestead entry perfected and surveyed, approxi-

mately ₡50, for which the government has received only ₡20, leaving the cost to the government for each homestead perfected approximately ₡30.^a

SALES.

[CHAPTER II.—Public land act.]

During the fiscal year 86 sales applications were received, covering an area of 2,697 hectares, and up to June 30, 1907, there have been received in the bureau 168 sales applications covering an area of 4,987 hectares. Of these entries, 14 sales have been accomplished, consisting of 1,347 hectares, to the value of ₡15,928.01, of which amount ₡3,984.06 have been received, and the balance, ₡11,944.03, will be due within the five years provided by law. One sale of 16 hectares was relinquished after the first payment of ₡40.80, leaving a balance of ₡122.40 unpaid. Statements showing the sales applications received, by provinces (on file at Bureau of Insular Affairs), and the status of same to June 30, are attached to this report. Sales applications received prior to this fiscal year, owing to ignorance of the law on the part of the applicants, have been such that in 5 cases no bids were received. Of the 168 applications received, 3 from individuals were of no value whatever, and were immediately rejected; 13 were from corporations, and averaged 267 hectares each, while 152 filed by individuals had an average area of 9 hectares each. Of the 152 bona fide applications for sales 36 included an area of less than 1 hectare, 24 an area of from 1 to 5, 40 from 5 to 16, and 52 of 16 hectares each.

Section 17 of the sales chapter of the public land act provides for free surveys when the purchasers are individuals, and the cost thereof, when such small areas as mentioned above are sold, more than exceeds the appraised value placed upon the land, and, in consideration of the fact that the government pays for the advertisements of sale, it will be observed that applications for quantities of land less than 5 hectares, if sold, result in an expense to the government, and if not sold, the government must bear all the expense of advertising. If future experience does not show a change in this condition, an amendment of the law should be made, providing that in no case in the sale of public land should the price received be less than the expense of the sale to the government.

Under the present law individuals and corporations are restricted to the purchase of one tract only of public land. From past experience it is believed that either individuals or corporations should be allowed to purchase as many contiguous tracts as they desire, provided the total area does not exceed that provided by law. The advantage of such an amendment being that applicants could then purchase one tract up to the limits of their resources and, after such tract was brought under cultivation, could extend the limits of their holdings by the purchase of an additional tract or tracts. The class of people who would take advantage of this amendment are those who assist materially in the development of the agricultural resources of the country. It is probable that during the coming year an increased number of sales of public lands will be accomplished and increased revenue from this source result.^b

LEASES.

[CHAPTER III.—Public land act.]

Only 12 lease applications, covering an area of 5,921 hectares, have been received during the fiscal year, making a total of 22 on file to June 30, 1907, covering 12,279 hectares. Six of said applications, covering 3,798 hectares, have been withdrawn, and the balance are in various stages of progress. One lease of 32 hectares, with an annual rental of ₡16 has been executed. The question of surveys has delayed the execution of further leases, as the cost thereof is charged against the applicant, and it has been impossible for this bureau to furnish surveyors. Detailed statement covering the status of lease applications is submitted herewith.^c

^a A detailed statement showing homestead applications received during 1904–1906 has been omitted and filed in the Bureau of Insular Affairs, War Department.

^b A detailed statement showing sales applications received during 1904–1907 has been omitted and is on file in the Bureau of Insular Affairs, War Department.

^c A detailed statement showing lease applications received by this bureau, and their status June 30, 1907, has been omitted and is on file in the Bureau of Insular Affairs, War Department.

It is estimated that several leases in the Davao district of the Moro Province will be accomplished during the coming year, as several applications for survey have been received, and a surveyor is in the field at the present time, and it is expected that there will be sufficient work to keep a surveyor there for at least a year. There are now believed to be about 30 hemp plantations on public lands which have recently been started in the district of Davao, in the Moro Province. These settlers requested through the Moro legislative council the extension of the public land act over the Moro Province, and the Philippine Commission extended the lease chapter of the public land act over the district of Davao, excluding 5 municipalities. The settlers were not entirely satisfied, as they could not purchase these lands, and did not feel warranted in leasing land and making extensive improvements on the basis of a 25-year lease. Their objections were stated through the legislative council of the Moro Province to the Philippine Commission, who referred the matter to this bureau, and the following is an excerpt from the minutes of the council and the reply of this bureau thereto:

"Sec. 5. But all persons or corporations in the district of Davao, who come within the terms of the resolution of the Philippine Commission extending to the Moro Province certain provisions of the public land act, stated in such resolution, which provides for the leasing of public land within the Moro Province, shall have preferential right of purchase from the government, at the price fixed by law, of the said leased or occupied land by such person or persons or corporation, at the time such public lands are made available for sale and purchase, or at any time thereafter, subject only to the limitations provided by law as to the amount of land which each person or corporation may by purchase acquire."

To which this bureau replied as follows:

"It appears that those now occupying public land in the Moro Province have a reasonable ground for complaint, but the remedy proposed is not, in my opinion, the proper one. It should be, that those who have occupied and leased public land in the Moro Province within the district in which public land may not now be obtained by purchase, should be permitted, within one year from the date when the purchase clause of the land act is applied to said district, to make application for the purchase of the tract of land previously leased, and agree to relinquish their leasehold rights upon the sale of said tract of land under the provisions of the public land act: *Provided*, That in fixing the valuation of the land to be placed upon sale by the bureau of lands, the appraisalment shall be made as if on the date of the original lease of said land, without regard to the improvements made thereon by the lessees; and an additional appraisalment shall be made of the improvements found upon the ground at the time of appraisalment; and that bidders shall bid separately upon the ground and upon the improvements so that, in case the lessee becomes the successful bidder the government shall receive only the amount paid for the land; and in case the lessee is not the successful bidder, then the government to reimburse him for the amount received from the successful bidder for the improvements. In this manner, those who have leased public land and are making improvements would be reimbursed for such improvements provided they were not the successful bidders, and would not be compelled to pay a second time for their improvements were they the successful bidders. In other words, at the present time a corporation taking up land in the Moro Province and leasing same has no guaranty beyond fifty years, when all it has spent in improvements may be lost, while at the same time it is now prohibited by law from purchasing the land, due to the fact that the sales chapter does not apply in said province."

It is the opinion of this office that every consideration should be given those settlers who have gone into the island of Mindanao for the purpose of pursuing an agricultural career, and it is believed that as soon as possible the land act should be further extended in this island, and recommendations should be called for from the government authorities as to in what districts and to what extent the land laws could be extended to this province without jeopardizing the interests of the native inhabitants or interfering to any great extent with their tribal customs. Reports from the district of Davao lead to the belief that the settlers are becoming satisfied with the lease provisions of the law which has been extended to them as they understand its purport; and whereas heretofore

they were complaining of the area which they were allowed to take up, they are learning that a plantation of 1,024 hectares is a very large plantation; in fact, so large that few, if any, of them will be able to cultivate it entirely for many years to come, as most of the settlers represent corporations with limited capital. It is believed that little, if any, further complaint will be made.

The appointment of deputy land surveyors, as heretofore recommended by this bureau, who could make surveys of public lands to be leased, would materially assist in accomplishing leases.

FREE PATENTS TO NATIVE SETTLERS.

[CHAPTER IV.—Public land act.]

The number of free patent applications received was 8,607, and the number received previous to the last fiscal year was 730, making a total on file of 9,337, covering 30,230 hectares, an average of $3\frac{1}{2}$ per application. The great increase in the number of applications received this year is due, in a great measure, to the work of agents of this bureau traveling through the provinces instructing the people in preparing their applications. Of the total number received, 1,061 have been rejected, canceled, or withdrawn. There are ready for survey and investigation 6,775, and the balance are in various stages of completion. Detailed statement showing, by provinces, the number and area of applications received and their present status is submitted here below.^a It will be noted that by far the largest number of applications for free patents has come from the provinces occupied by the non-Christians. These figures tend to confirm the predictions of this bureau in the last annual report that the provisions of this chapter are of more benefit to this class of people than to any other. One difficulty which tends to delay the presentation of applications is the inability of the petitioners to properly prepare their blanks or secure internal-revenue stamps, and even the agents of this bureau have been compelled to remit large numbers of applications with the money for stamps, as no internal-revenue stamps were available.

It should not be presumed with 6,775 applications pending investigation and survey that anywhere near such number will finally be allowed, for the reason that the same remarks which applied to homesteads apply to free patents, and it is almost certain that hundreds of these applications, when critically examined upon the ground, will be found defective and declared void, and the applicants will be found to have no right to avail themselves of the provisions of this chapter. Act No. 1573 of the Philippine Commission extended the time within which applications under this chapter could be presented from January 1, 1907, to January 1, 1909. Objection to this extension was made in the last annual report of this bureau for the reason that practically all property holders outside of the non-Christian peoples who could comply with the provisions of this chapter have been in possession of their lands a sufficient length of time to avail themselves of the provisions of "Chapter VI—Unperfected titles," and they would suffer no particular hardship if this chapter had been allowed to stand as originally enacted. It was contended that the fee of ₱20 for registration in the court of land registration was not excessive, and as recent legislation has reduced this fee to ₱10 where the property does not exceed ₱200 in value, it is urged that no further extension of this provision of the public-land law be made; but if the same is made it is recommended that it contain a provision compelling the applicants to reimburse the government for the entire cost of granting patents under this chapter, including the survey. It has heretofore been stated that the average area of a free patent applied for is about $3\frac{1}{2}$ hectares. On the basis of the average cost of surveys in this bureau for the past year, the cost of each free-patent survey will exceed ₱10. It is estimated that the cost of an investigation of the rights of an applicant to a free patent, the clerical work in relation thereto, and the issuance of a patent will be ₱20—that is, the expense to the government for each free patent issued will be at least ₱30. This being the case, and assuming that even two-thirds of the applications received are granted, it will mean an expense to the government of approximately ₱200,000, with a year and a half in which to receive further applications under the provisions of the law. Many

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

applications for free patents have been denied on account of the noncompliance with some of the provisions of the law in relation to occupation, and in the notifications to the applicants of the denial of their applications has been included advice to secure their land under the provisions of the homestead law, and many have followed such advice. It is estimated that several thousand more free patents will be filed during this fiscal year, as they are being received at the rate of about 500 per month.

TOWN SITES.

[CHAPTER V.—Public land act.]

At the close of the last fiscal year Bagulo town site was the only town site which had been reserved and only one other had been ordered surveyed. There are now seven which are receiving the consideration of this bureau, as follows: Four in the Moro Province (Parang, Jolo, Dansalan, and Malabang), one in Zambales Province (Olongapo), and one in Bulacan Province (Sibul Springs), all in addition to the Bagulo reservation. In relation to the Bagulo town site it may be stated that during the year an addition thereto was made consisting of 2,995.38 hectares, making the total area of the town site 5,595 hectares, or 21.6 square miles. A third subdivision of lots has been surveyed and platted, and a second sale was held in Manila on July 20, 1906, at which time all the lots which had been surveyed were disposed of at prices ranging from 2 to 13 centavos per square meter, a material increase over the prices formerly obtained. Some delay has been occasioned in the placing on the market of further lots for sale by the fact that prior to the survey of any new lots the approval of the insular architect is necessary, and while it was confidently expected to have a sale the latter part of the year, the same has necessarily been postponed, but should be held within sixty days. The purchasers of lots in the Bagulo town site have not been confined to persons in the government employ; in fact, a majority of the purchases in the second sale were by persons in no way connected with the government, thus disproving the oft-repeated assertion that Bagulo would be exclusively for government officials and employees. The military reservation at Bagulo within the town site has recently been increased in size by Executive Order of the President. This addition is located to the south of the former reservation and does not interfere with the original plans of the subdivision contemplated by the insular government. There have also been submitted and approved by the Philippine Commission during the year a market site in the municipality of Bagulo, a park reservation, and an industrial school site reservation. In addition a large plot of ground was sold for educational purposes. Patents for the first sales of Bagulo lots have been signed by the chief executive and sent to the register of deeds at Bagulo for the issuance of titles. Detailed statement^a showing the lots sold in the Bagulo town site is submitted herewith, which shows that there have been sold 196 lots containing an area of 189 hectares to the value of ₱25,502.62, in addition to the valuation of the school buildings sold of ₱6,200.

UNPERFECTED TITLES.

[CHAPTER VI.—Public land act.]

There have been received 367 notices from the court of land registration relative to applications which have been presented to said court, in which the applicants have requested the benefits of Chapter VI of the public land act. An investigation of these cases has led this bureau to request the attorney-general to enter appearance in 128 cases and opposition in 54. No action was taken in the balance, as in the opinion of this bureau the applicants were entitled to the registration of their property, or the land involved was not of sufficient value to warrant opposition by the government. Experience has demonstrated that it will be absolutely necessary for this bureau to adopt a very rigid course in the investigation and opposition of cases where large areas are involved, as it is found that actual occupation as contemplated by the law has, in most cases, not been sufficient to warrant the registration of the areas applied for, and unless his course is pursued the government will lose large tracts of valuable land. Several cases which have been decided by the court of land registration in favor of the applicant have been appealed to the supreme court at the request

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

of this bureau. Such cases usually involve general principles, such as the granting of titles to nonagricultural lands, which appears contrary to law; or that the evidence presented did not show open, continuous, exclusive, and notorious possession and occupation. Some of the decisions of the supreme court in cases during the year have been of value to this bureau, and better enable future opposition in cases where the applicant has occupied, cultivated, and used only small parts of large claims, and endeavored to obtain title to entire claims. In one decision it was held, by implication, that the pasturage of cattle upon land did not constitute occupation, and that actual, physical occupation of the land under the provisions of section 54 of the public-land act is necessary to prove possession. With reference to paragraph 6 of section 54 of the public land act, it may be stated that there are many persons in the islands who lay claims to immense tracts of land which they have never owned, and who know that their only proof of occupation is that the said land has been used for pasturage purposes. However, they make their applications before the court of land registration under this paragraph, and unless strenuous opposition is maintained they may secure title. This appears contrary to the spirit of the law and it is believed not to have been the intention thereof, as it does not encourage agriculture, but gives control of large tracts of land to those who allow them to remain idle to the exclusion of applicants who, if they were permitted to take up said lands under the public land act, and cultivate them, would do so. This provision of law also tends to the extension of caciquism, and prevents small holders from obtaining possession of the land by them occupied. It is suggested that an amendment to this section, to the effect that the land shall have been cultivated, would not cause injustice, and deserving persons who apply for registration under the benefits of this chapter, as well as the government, will have their respective interests safeguarded.

Sections numbered 58 and 66.—In the last annual report it was anticipated that this bureau would be delayed in the work of surveying under the provisions of section No. 66. This prediction has come true, and complaints are heard of the inability of this bureau to keep up with its surveys. During the year there have been 109 surveys under the provisions of this section at a cost to the government of ₱10,825, or an average of about ₱100 each. There are upward of 1,000 cases now pending in the court of land registration which must, as soon as decreed, be surveyed by this bureau at government expense, before final decree can issue. If the cost of said cases averages anywhere near the cost of the cases already surveyed, the cost of cases now pending will be ₱100,000, which is an item of great importance, especially when it is considered that it will be a constant, increasing expense in the future. On the other hand, during the year, at the applicants' request under section 58 of the law, there were made 60 surveys costing ₱3,041.72, averaging about ₱50 each survey. The reason for the difference in the cost of these surveys under the different chapters is the fact that where the applicant applies for a survey and pays for same he wants it done at the cheapest rate possible, is willing to subsidize the surveyor, furnish him labor, clear the boundary lines, furnish material, and possibly construct the monuments, and in every way assist the surveyor to reduce the amount of his work and the length of his stay on the property. On the contrary, under the provisions of section No. 66, a surveyor has difficulty in even getting the owner to point out his boundaries and can obtain no assistance from him in any way, as, under the provisions of section No. 58, the survey is at government expense. Notwithstanding the fact that the owner must obtain some kind of a survey of his property before it is presented to the court (and it is reasonable to presume that if he could obtain same he would prefer a survey by the bureau of lands which would be official when presented to the court), it is now absolutely impossible for this bureau, with the small force of surveyors authorized, to do the work. This enormous expense to the government should be stopped immediately, and the most reasonable solution of the situation which this bureau can suggest is that the bureau be authorized to employ a sufficient number of surveyors to thoroughly cover the islands—say, one or more in each province, as the work demands—such surveyors to do the work under the provisions of section No. 58. By such a method, not only would the government save the entire expense of the surveys as now made, but the property holders would save at least a considerable percentage of the high price now paid to surveyors in private practice, whose surveys and plans are, in most instances, absolutely worthless. Another reason why some means should be adopted to stop the expenditures by the government for section No. 66 surveys is that there is no just cause existing for expending large sums of

money from the general treasury for the benefit of a comparatively few individuals. Neither do the property holders desire surveys under section No. 66, even though it causes them no extra expense, as it involves a delay in securing their title, and they have already paid a high price for the plan of their land which they present to the court. It is believed that the theory of the framers of this section of the law was that section No. 66 surveys would segregate government from private land. This perhaps is the case in a small percentage of the surveys, but it does not appear that this small number of cases warrants the expense in surveying a much larger percentage where no government lands adjoin. It is estimated that not over 5 cases in 100 are bounded by government lands. If the work of the court of land registration proves a success, instead of 1,000 cases per year the result should be 5,000 per year decreed under the provisions of this section, and the cost for surveys would approximate ₱500,000 each year. Therefore it is proposed that if it is not feasible to increase the personnel of this bureau for this purpose, the bureau be authorized to expend funds received for surveys made under section No. 58, for the payment of the personnel and expenses for further surveys under this same section of the law. Thus the bureau would be unrestricted by being confined in this survey work to the personnel authorized by the appropriation acts, and could employ surveyors and pay their expenses from funds received from the work they perform. As this bureau charges 10 per cent over and above the cost of such work, and as it would be possible to do a great amount of this work if the authority were obtained, it is reasonable to believe that this solution of the problem would be a successful one.

MINERAL AND MINING CLAIMS ON PUBLIC LANDS UNDER THE MINERAL LAW OF THE PHILIPPINE ISLANDS.

Coal claims.—During the past fiscal year 136 coal entries have been recorded in this bureau, covering an area of 8,156 hectares, in addition to 150 entries covering an area of 9,139 hectares filed previous to this fiscal year, making a total of 286 coal entries to June 30, 1907, with an area of 17,295 hectares. Details of the status of these entries are shown in the statements submitted herewith [on file in the Insular Bureau], including the provinces in which claims are located. During the past fiscal year 143 entries that were pending action at the close of the previous fiscal year were canceled, as the applicants failed to complete their entries within the year. Two entries have been perfected, patent issued, and ₱12,800 received for same. Of the 136 entries filed during the past fiscal year, 18, covering an area of 1,052 hectares, are undergoing survey. The coal of the islands is now being seriously considered by railroad companies and other corporations, and from present indications it is believed that several of the entries will be perfected during the coming year. It may be said that a majority of the entries to date have been of a speculative character, and the parties filing such entries have had no intentions nor resources to secure final patent. There have been also some of the claims dating from the first years of American occupation presented for opinions as to their validity. These claims, aside from having no legal value, are the results of questionable proceedings, and the opinion of this office has been rendered accordingly. Applications have been received for 18 coal-land surveys, which have been ordered.

MINERAL AND MINING CLAIMS OTHER THAN COAL.

Prior to the last fiscal year it was impracticable to definitely state the number of mines and mineral claims located in these islands, in view of the fact that provincial secretaries acting as mining recorders failed to render reports. Therefore this report treats of all claims located since the enactment of the mining law in 1902. During the past year there were 427 lode and 92 placer claims filed throughout the islands, while prior to the beginning of the fiscal year there were 1,174 lode and 441 placer claims filed—making a total of 1,601 lode and 533 placer claims filed to June 30, 1907. There is submitted herewith a detailed statement of all mineral and mining claims filed in the Philippine Islands since the enactment of the mining law to June 30, 1907, showing the kind of claim, the minerals, and the province where located.^a During the year 13 mineral patents have been applied for, none of which has as yet been accomplished. Twenty-one applications for survey by this bureau have been received, and as these are about completed it is anticipated that patents will issue immediately. That minerals, in quantities sufficient for the industrial success of

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

mines, are to be found, has heretofore been somewhat in doubt, but experience during the past year has demonstrated that gold mining will be one of the successful industries of the Philippine Islands.

Up to the present time the provincial secretaries or their successors (who in many instances are the governors of the various provinces) have been acting as mining recorders. While this is satisfactory in the matter of the recording of mining claims, it is not satisfactory when an application for a patent is made, as the recorders, in many cases, do not know how to proceed, and it is necessary for this office to give specific instructions in each case, as it is essential that a critical examination be made of all papers in an application for a mining claim before a patent can issue, and that all documents should be legally in compliance with the terms of the mining law, and such an examination can only be made in this office. It is therefore believed that further experience will demonstrate the necessity of designating the local land officer in each province as mining recorder.

SURVEYING AND DRAFTING.

During the past year the division of surveying and drafting has accomplished the survey of 17,168 parcels of land, containing an area of 68,573 hectares, at a cost of ₱211,563.59. The average area of each parcel surveyed was about 4 hectares and the average cost was ₱12.32 per parcel, or about ₱3.08 per hectare. These figures, however, do not include the cost of computation, drafting of plans, tracings, or furnishing of blueprints for each parcel, except in a comparatively small number of cases—say, 2 per cent of the whole number—but does include the cost of location and erection of monuments for reference purposes.

At the close of the fiscal year the technical force of employees available for surveying and drafting purposes consisted of 26 classified and 24 unclassified, or a total of 50 employed, while there were 75 authorized positions. The dearth of available men to fill surveyors' positions naturally delayed the work undertaken, but the vacant positions were filled as fast as candidates were available, and every effort was made until, at the close of the fiscal year, there were 44 classified and 31 unclassified employees engaged in this work, every position being filled by men having some qualifications, and it is estimated that the entire force employed in this division had an efficiency of about 80 per cent in results produced, compared with what a qualified force would have accomplished. However, the gain during the year of 18 surveyors in the classified service is gratifying and better results will be forthcoming in the year to come. Two Filipino surveyors have qualified in the civil-service examinations, but all of the rest of the technical force used in surveying is American. An increase of force in this division is considered essential during the coming year by the addition of 10 surveyors, 10 computers, and 11 draftsmen, in order to undertake the work already accumulated. This increase is not due to the Friar lands surveys, but to the large number of public land and mineral surveys. Town-site surveys have been ordered for Parang, Sibul Springs, Bagulo, Jolo, Malaban, Olongapo, and Dansalan. Surveys of 12 reservations of public lands, 60 lode claims, 20 coal claims, and 10 placer claims have also been ordered. It is also estimated that 400 surveys under section 66 of the public land act will be ordered by the court of land registration, and that 200 surveys under the provisions of section 58 of the public land act will be applied for. In addition 24 lease and 2 sales surveys of public lands are pending, and there are further applications on file for public lands which will require survey. There are pending, under the free-patent chapter of the public land act, over 6,000 free-patent entries which require surveys, and it is estimated that approximately 1,000 such surveys may be completed during the year. It is also hoped to begin the monument and road location surveys, whereby it is expected to locate in each town two monuments, determine the location thereof with reference to the surveys made by the coast and geodetic survey, connecting same with surveys along the roads from town to town in such a manner that the location of properties surveyed in the future may be definitely determined, as in the past ordinarily land surveys have not been tied to any determined monument.

The work of the division naturally falls under the following subheads, and will be so considered: Friar land surveys, public land surveys, drafting, computations, and student surveyors.

FRIAR LAND SURVEYS.

During the past year there have been surveyed 62,239 hectares on the friar estates, making a total area surveyed to date of 95,528 hectares; leaving 63,144

hectares to be surveyed during the coming fiscal year, in conformity with the plan approved by the Philippine Commission at the beginning of the fiscal year 1906 for the completion of the friar land surveys within two years. To accomplish this purpose it will necessitate 10 parties, each with a chief and 3 transit men, 1 cook, 1 draftsman, 3 sketchers, 6 chain men, 12 rodmen, and about 20 laborers, and dispositions have been made accordingly.

The computation work on the friar land surveys has been delayed by the lack of qualified men, but it is hoped with the aid of mechanical computers and additional employees to make up for the delay during the following fiscal year.

The following statement shows a summary of the work accomplished on parcel surveys of the friar lands estates during the fiscal year, and the cost per hectare surveyed.^a Such cost, however, does not include computations nor drafting.

This statement shows that the cost of surveying ranges from ₱0.52 to ₱7.31 per hectare, or an average of ₱3.09, including the Isabelita estate, where the parcels were uniform in size and of large area. If the average for this estate is excluded, the cost may be stated at ₱4.30 per hectare, which is about the average cost of making such parcel surveys. The high cost per hectare of surveying which the statement shows on the Banilad estate is due to the changes in the personnel, to resignations, and the necessity of breaking in new men, to the cost of transportation to and from the estate, and to the fact that the party has been broken up for other surveys in its vicinity on different occasions; while the high cost shown of the Orion estate includes the cost of computation. Wherever the cost is shown as exceeding ₱5 per hectare, it has been necessary to make changes of chiefs of parties and to use inexperienced men in this work, and it may be stated that during the coming year, as the surveyors gain in experience, the cost per hectare for the work will decrease. The size of the parcels on an estate also affects the average cost per hectare on that estate—for instance, on the Calamba and Imus estates, each, having large parcels formerly cultivated in sugar, shows a cost for surveying below the average; while the estates, devoted to the culture of rice, and having many barrio and town lots of small dimensions and very few large farm lots, show a cost per hectare above the average. The size of the survey party also affects the cost, it having been demonstrated that a party of the size mentioned herein as necessary to complete the friar land survey in a year has been the most economical.

It has been impossible, up to the close of the year, to begin the surveys on the Santa Cruz de Malabon, Tala, Piedad, or the Talisay-Minglanilla estates. However, work will be begun on two of the estates during the month of July, and with the increased provision for surveyors which is expected during the coming year, work on all the estates will have been begun before September 1. The following statement shows the balance of the work to be done on friar land surveys, and the estates on which surveys are incomplete:

AREA OF PARCEL SURVEYS TO BE MADE ON FRIAR LAND ESTATES DURING THE FISCAL YEAR 1908.

Estate.	Total area.	Percentage of area to be surveyed.	Area, hectares, to be surveyed.
San Francisco de Malabon.....	11,440	47.2	5,286
Tala.....	6,686	100.0	6,686
Piedad.....	3,860	100.0	3,860
Muntinlupa.....	2,827	40.1	1,030
Talisay-Minglanilla.....	8,020	100.0	8,020
Imus.....	18,243	47.3	8,686
Calamba.....	13,673	50.5	6,912
Lolombo (Bocane parcel).....	4,901	31.7	1,511
Nalc.....	7,624	52.1	3,960
Santa Cruz de Malabon.....	9,795	100.0	9,795
Santa Maria de Pandi.....	10,342	71.7	7,405
Total, on 11 estates.....			63,144

Brought forward, area to be surveyed, 63,144 hectares.

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

PLAN OF
ORION ESTATE
BATAAN PROVINCE



MANILA BAY

1871

1871

1871

Survey to date.	Hectares.
San Jose estate, fiscal years 1906 and 1906.....	23,286
Isabela estate, fiscal years 1906 and 1907.....	19,891
Other estates reported, fiscal year 1906.....	10,026
Other estates reported, fiscal year 1907.....	42,348
Total friar lands surveyed to date.....	95,531
Total area friar land estates.....	158,675

In order to illustrate the amount of work necessary in the survey of a friar lands estate, the following plan of the Orion estate in Bataan Province is submitted, showing the parcels as surveyed. This estate covers an acre of 901 hectares, and is divided into 651 lots, an average of 1.38 hectares to each lot. Attention is invited to the irregularity in the size and shape of the lots, the numbers of sides and corners, and the fact that most lots have banana, bamboo, mango, or other trees, or rice dikes along their boundaries in such a manner that any attempt to change the boundaries or square the lots meets with the objections of the tenants. Thus it has been found impracticable to survey this estate in regular or rectangular parcels, or, except in a very few instances, to change the boundaries of parcels. This condition has made surveys more expensive than they would otherwise be on all friar lands estate which are occupied.

PUBLIC LAND SURVEYS.

The public-land surveys completed during the year are shown in the following statement, which also includes the area, the total cost, and the cost per hectare:

SUMMARY OF COST AND NUMBER OF PUBLIC-LAND SURVEYS EXECUTED BY BUREAU OF LANDS DURING FISCAL YEAR 1907.

Class of survey.	Number of surveys.	Number of parcels.	Area.	Cost.	Cost per hectare.	At cost of—
			<i>Hectares.</i>			
Section 58, act No. 926.....	46	60	1,608.62	₱3,041.72	₱1.89	Applicant.
Section 66, act No. 926.....	92	109	3,795.52	10,825.09	2.85	Government.
Mineral claims (lode).....	12	12	94.72	1,793.88	18.94	Applicant.
Leased land.....	1	1	31.99	125.00	3.31	Do.
Town site (subdivision).....	1	48	71.47	1,680.47	23.51	Government.
Town site (boundary).....	1	1	25.00	703.16	28.13	Do.
Civil reservations.....	5	5	685.64	610.57	.89	Do.
Government lands.....	1	1	.09	50.00	555.55	Do.
Private lands.....	1	1	21.28	33.40	1.57	Do.
Total.....	160	238	6,334.33	18,883.29	2.98	

In addition to above-mentioned surveys completed as per statement, there were 17 mineral surveys made by deputy mineral surveyors, in which this bureau prepared the plans and final notes, collecting therefor ₱50 per survey, and there are 12 such surveys pending. The following surveys are in various stages of progress, and estimated to be 75 per cent completed:

SURVEYS ORDERED AND FIELD WORK COMPUTATIONS AND PLANS PENDING COMPLETION JULY 1, 1907.

Section 58, act No. 926.....	9
Section 66, act No. 926.....	82
Mineral (lode).....	21
Mineral (coal).....	21
Leased land.....	9
Sales applications.....	3
Town site (subdivisions).....	1
Civil reservations.....	7
Free patents.....	383
Total.....	536

Surveys made under the provisions of section 58, Chapter VI, of the public land act, are made at the expense of the applicant. This subject is treated of in connection with the report on public lands, "Unperfected titles," together with the subject of surveys under section 66 of the same act. The following statement shows the number of surveys made under section 58, the areas, provinces, cost, etc.:

Province.	Number of surveys.	Number of parcels.	Area.	Cost.	Cost per hectare.	At cost of—
			<i>Hectares.</i>			
Albay.....	2	2	31.37	₱121.20	₱3.86	Applicant.
Oavite.....	1	2	8.01	173.94	57.75	Do.
Laguna.....	12	12	14.42	266.57	18.05	Do.
Mindoro.....	21	21	917.15	965.00	1.18	Do.
Nueva Ecija.....	2	3	89.80	157.40	1.75	Do.
Pampanga.....	2	2	72.23	117.78	1.63	Do.
Pangasinan.....	2	4	86.55	330.38	3.82	Do.
Rizal.....	1	1	1.11	40.85	36.72	Do.
Sorsogon.....	2	12	470.51	758.42	1.61	Do.
Tarlac.....	1	1	22.07	110.18	4.90	Do.
Total.....	46	60	1,608.62	3,041.72	1.89	

Surveys made under the provisions of section 66, Chapter VI, of the public land act are made at the expense of the government. The following statement shows the number of surveys made under said section during the year, the area, provinces, cost, etc., and attention is invited to the difference in cost between such surveys and those made under section 58 at cost of applicant, made generally by the same survey party under like conditions, except that applicant renders every assistance in one case, while in the other case almost no assistance is rendered. In fact, in some instances the failure of the applicants to appear and point out their respective boundaries has often caused delay.

COST OF SECTION 66 SURVEYS, FISCAL YEAR 1907.

Province.	Number of surveys.	Number of parcels.	Area.	Cost.	Cost per hectare.	At cost of—
			<i>Hectares.</i>			
Albay.....	10	12	191.67	₱1,352.49	₱7.06	Government.
Camariues.....	2	2	219.80	976.71	4.44	Do.
Laguna (original).....	7	7	37.65	357.05	9.48	Do.
Laguna (resurvey).....	7	7	37.65	326.10	8.65	Applicant.
Manila.....	4	6	12.38	135.88	10.97	Government.
Mindoro.....	17	17	1,792.54	2,919.00	1.63	Do.
Nueva Ecija.....	5	5	122.23	467.27	3.82	Do.
Pampanga.....	11	22	841.63	1,458.13	1.73	Do.
Pangasinan.....	10	11	119.11	912.75	7.66	Do.
Rizal.....	10	10	105.42	904.05	8.60	Do.
Tarlac.....	9	10	315.41	1,015.66	3.22	Do.
Total.....	92	109	3,795.52	10,825.00	2.88	

In connection with the above statements it may be stated that only two regular parties have been in the field making this class of surveys during the year. One party consisted of a high-salaried, experienced American surveyor and an American transit man, and the other a qualified Filipino surveyor and Filipino transit man. A comparison of the cost of the surveys made by these two parties shows the average cost per hectare for the American surveyor as ₱1.71, and the average cost of the Filipino surveyor's work as ₱2.91 per hectare. This demonstrates that experienced and higher-priced American surveyors accomplish their work at a lower cost per hectare than those Filipino surveyors who, although qualified, have had less experience, and receive lower salaries, in addition to the better quality of the work and less chance of error.

The following statement shows the surveys not otherwise reported which were made during the year:

Class of survey.	Number of surveys.	Number of parcels.	Area.	Cost.	Cost per hectare.	Province.
			<i>Hectares.</i>			
Lode claim.....	12	12	94.72	₱1,793.88	₱18.94	Sorsogon.
Leased land.....	1	1	31.99	125.00	3.91	Bataan.
Government land.....	1	1	.09	50.00	555.55	Manila.
Town site subdivision.....	1	48	71.47	1,680.47	23.51	Benguet.
Civil reservation (Egbert and Stotenburg monuments).....	2	2	1.99	50.00	25.13	Bulacan.
Civil reservation (school).....	1	1	8.09	206.97	25.58	Isabela.
Do.....	1	1	17.71	6.00	3.34	Sorsogon.
Do.....	1	1	657.85	347.60	.53	New Ecija.
Private land.....	1	1	21.28	33.40	1.57	Rizal.
Town site (boundary).....	1	1	25.00	703.16	28.12	Bulacan.
Total.....	22	69	930.19	4,996.48	5.37	

Very few applications for mineral surveys have been made during the year, and wherever possible such surveys have been referred to deputy mineral surveyors, three of whom, after filing bonds, were appointed during the year, and have completed 17 surveys which have been accepted by this bureau. The bureau makes a charge of ₱50 each for checking, platting, and preparing field notes. These deputy mineral surveyors are compelled to conform to instructions issued by this bureau relative to mineral surveys, and although this caused them considerable trouble in the beginning, it is absolutely essential in order to obtain accurate surveys of mineral claims. The cost of mineral surveys made by this bureau was ₱18.94 per hectare.

Other public land surveys that are mentioned in the statement above are so few that as yet no general idea can be obtained of the cost thereof. On the completion of those stated as incomplete, the relative cost of the different classes of public land surveys may be obtained.

The work on free patent surveys which has been undertaken in Benguet Province has been done in combination with an accurate topographic survey which has been completed of the entire Agno River Valley and parts of the Trinidad and Naguilan valleys. Numerous points have been checked by triangulation and the topography roughly sketched by contours. The main trails between Bagulo and the Agno River have been surveyed and reference monuments have been established in every barrio where the surveyor has been at work. A final map of about two-thirds of the entire province of Benguet will be completed during the coming year.

Further subdivision of lots in the Bagulo town-site reservation is being made with a view to another sale as early as possible, which will consist of 20 lots in Section A and 19 in Section F. A survey party has also been at work for some weeks upon the Sibul Springs town-site reservation.

The following applications of public land surveys are pending: Seventy-five under section 58, act No. 926; 56 under section 66, act 926; 3 of leased land; 13 on sales application; 4 town site; 3 civil reservation, and as many as it is possible to make during the year on free patents granted, there being over 6,000 applications now on file. There have also been allowed 748 homestead grants on which surveys will be necessary in the future. It is estimated that there are now surveys sufficient to keep 13 parties in the field during the year, not including applications that are expected to be filed during the year.

DRAFTING.

There has been no attempt to segregate the cost of drafting from that of computation, except the total cost of drafting and computing for each separate survey. However, it appears necessary to keep such cost entirely separate, and during the coming year such records will be kept of the time consumed, so as to segregate the cost of drafting and computing separately for each survey. The amount of drafting done has been greatly increased, and blank forms for final sheets, tracings and final notes have been adopted for each different kind of survey, so that uniformity will prevail, and that, wherever possible, the legends and certificates may be printed, thus saving the time of the draftsman.

Nine hundred and ninety triangulation points throughout the Philippine Islands, located by the coast and geodetic survey, have been platted upon poly-

conic projection sheets, at the scale of one inch to the mile, and also the coast line, wherever it has been determined by the coast and geodetic survey. It is proposed to continue this work, as accurate surveys are made, notes of which will be obtained either from the coast and geodetic survey, or from the surveyors of this bureau, which will finally result in a map of the Philippine Islands on this scale. The boundary lines of some 30 large haciendas scattered throughout the islands have also been obtained, but until some connection can be established between the triangulation points of the coast and geodetic survey and some point on the boundary of each hacienda, they can not be accurately platted upon these sheets.

COMPUTATIONS.

Computations during the year have been made almost entirely by surveyors prior to their entering the field service; thus a new surveyor or transit man, on being employed, was usually kept in the office for two or three months, until he became thoroughly conversant with the methods of the office work, during which time he was used on computation work. Thus constant changes of computers has occurred, which has delayed the work upon computations on the surveyed friar lands. However, provisions have been made for a permanent force of computers during the coming year, and this, together with the fact that it is expected to use mechanical computers for portions of the work, will, if successful, reduce the cost thereof.

Student surveyors have been used on computations wherever it has been possible, but it has been found absolutely necessary to have two entirely separate computations made, and upon completion thereof compare same for a check upon the accuracy of the work.

STUDENT SURVEYORS.

Under the provisions of act No. 1491 there was started in this bureau at the beginning of the last fiscal year a class of Filipino student surveyors. When this act was passed it was understood that there were students in the schools of the islands who were qualified for certification under said act, but during the year there were only 6 students so certified by the director of education, and two of said students dropped out of the class before the close of the year. All the students certified were from the nautical school, and it is believed they were students who were unable to keep up with their classes in that school. It was found necessary to give them instructions in both algebra and geometry, for until a student is well advanced in these two subjects he can assimilate only a limited amount of instruction in theoretical surveying, and that must be of the most elementary character. Four of the students remained with the bureau throughout the year, spending their afternoons and Saturdays on computation and practical work, and at the close of the school year were sent into the field with regular survey parties. They were reported to be interested in their work and eager for instruction, and since their return their class work shows marked improvement.

In order to obtain qualified students for the present year, recommendation has been made that students who have completed the second year in the public high school be certified as student surveyors. This lowers the standard for entrance and will necessitate a longer course of study in the bureau. Under this provision 12 second year high school students have entered the class and appear to be better qualified than the students received from the nautical school last year. These students now, instead of attending the school of arts and trades, are attending the class in the Manila high school, were it is expected the course will be continued throughout the year.

The 4 students who completed last year's work failed in their examinations and will therefore be required again to go over the work of the first-year student with the new class. While it is to be regretted that the class was not more of a success during the year, the failure may be said to be due to the fact that qualification for entrance was such that there were no available candidates, the public school not having qualified its students sufficiently in mathematics to take up the work of theoretical surveying.

SAN LAZARO ESTATE.

In the reports of this bureau for the fiscal years 1905 and 1906, considerable attention was given to the poor condition of the public streets on the San Lazaro estate, the lack of proper drainage, and the inadequacy of the water supply, the street lighting system, and the sanitary arrangements. Recommendations were made tending toward a correction of these conditions. A further discussion of this subject would only be a repetition of former reports, and all

that need be said is that the general conditions therein described remain unchanged. The attitude of the municipality is one of unqualified opposition to any plan involving the expenditure of its funds upon improvements in this district. This bureau has endeavored to arrange for the extension and improvement of streets, water mains, and light circuits without success, and has endeavored to have the sweepings from the streets of the city dumped into the so-called streets of the San Lazaro estate, in order that, for lack of more suitable material for street construction, the unfortunate residents of this district might at least have the benefit of this small improvement, but even this request has been refused by the city of Manila. The attitude of the city authorities is such that so long as the government refuses to pay taxes on the property no improvement of the streets need be expected. This is an anomalous condition of affairs, retarding the development of the estate and not considered justifiable, and it is suggested that if the city were compelled to pay its share of the expense of caring for the lepers picked up within its limits—approximately 200 at ₱0.75 per diem, say ₱150 per day—the attitude of its authorities might be changed.

The entire San Lazaro estate has now been subdivided into 116 blocks, exclusive of the hospital reservation. Of these, 73 have been surveyed and subdivided into building lots, 10 have been partially subdivided, 22 suitable for building purposes remain to be surveyed and subdivided, and 11 are so situated that the lands are only suitable for agricultural purposes and can not be used for building sites. The condition of the streets at present will probably delay the completion of this work, as some blocks are absolutely unapproachable during the wet season. Subdivision of this property is necessarily slow, as the greater parts of the lands are occupied, and after the survey has been completed reassignment of the lands and the removal or rearrangement of buildings are necessary. Some of the lands have been used for truck gardening purposes, and in each case it is necessary to allow the tenants time to harvest their crops before changes are made. However, it is estimated that surveys of all blocks suitable for building purposes will be completed within the first half of the coming fiscal year.

An attempt has been made to increase the number of tenants on the estate by advertisements which have been published in the daily papers of the city with some success; but as the majority of the tenants are not readers of newspapers and the demand for lots within the zone of strong materials is not great on account of the lack of funds to erect buildings, no great progress has been made in thus obtaining new tenants.

There are at present 2,629 lots occupied, of which 354 correspond to the old plan of the estate. There are 493 lots vacant in the new subdivision, the majority of which have been recently surveyed and are being rented by new tenants. When lands in the old subdivision become vacant they are not rerented until surveyed under the new plan, but the total area of such lots is now comparatively small. During the year 277 tenants were added to the rent roll, occupying 425 lots. There are now 1,693 tenants at will, 35 holding under six-year leases, and 6 holding leases for longer periods; or a total of 1,734 tenants on 2,629 lots leased.

The rearrangement of the houses into systematic block formation has greatly improved the general appearance of the estate. The individual tenant takes more interest now than formerly in keeping his home in good repair and in making additions to his buildings. Telephones are coming into use, and water and light connections are now found in some of the houses, even in the nlipa district. A large percentage of the houses which a few years ago were not subject to taxation on account of their trifling value have been repaired and enlarged, until they have become taxable at a considerable valuation.

During the year this bureau authorized the construction of 20 buildings of strong and 149 of light and mixed materials. Repairs and additions were also authorized upon 23 buildings of strong and 544 of light and mixed materials. The new Methodist Episcopal Church in course of construction at the corner of Calles Cervantes and Lope de Vega is a handsome building, which adds greatly to the appearance of the neighborhood. The bureau of prisons has begun the construction of an additional wall to inclose the site of a new prison hospital, soon to be constructed. The land which these improvements will occupy belongs to the estate.

During the fiscal year 1907 the total amount of rentals received from the estate was ₱53,467.37, as against ₱50,243.75 for the preceding fiscal year—an increase of a little more than 6 per cent.

The delinquent rent roll on June 30, 1907, amounted to ₱2,339.59, all of which should be collected within a few months.

The most successful method for the collection of rents seems to be that now in operation—the monthly house-to-house inspection demanding payment. These repeated demands eventually have the desired effect, but occasionally suits in ejectment have to be filed against the habitual delinquents, with the usual result that both rent and court costs are lost, through the fact that there is nothing with which to satisfy the judgments. During the past year very few ejectment cases were filed, but a number of complaints are now being prepared which will be filed within the ensuing month.

STATEMENT SHOWING RECEIPTS AND EXPENDITURES SAN LAZARO ESTATE, FISCAL YEAR 1907.

RECEIPTS.

Rents received for the period July 1, 1906, to June 30, 1907----- ₱53,467.37

EXPENDITURES.

Salaries, office force-----	₱5,088.43
Salaries, field party-----	2,090.42
Unrecovered court costs-----	740.64
Incidental expenses-----	1,246.69
Total cost of administration-----	9,166.18

Before this property can reach the highest point of financial productiveness, the public streets must be put in good condition, water mains must be extended to afford ample fire protection, the property must be drained and the electric-light lines must be extended. I recommend that all lands which the Commission ordered reserved for the extension and improvement of streets be formally conveyed to the city of Manila, free of all cost, but with the express agreement that the municipality shall, within the next two years, at its own expense, make the public improvements necessary for a good street system, the total cost of which shall not be less than the assessed value of the lands so conveyed. There is submitted herewith a plan showing the subdivision of the estate to June 30, 1907.

FINANCIAL STATEMENTS.

The following statements show the receipts and expenditures of the bureau of lands for the fiscal year 1907, segregated under the proper subheads. The first statement of expenditures as herein submitted shows the expenditures as made. The second shows the expenditures as assigned to the three natural divisions of this bureau—public lands, friar lands, and San Lazaro estate—the general office being charged merely with furniture, fixtures, and equipment, the cost of which can not properly be charged to any of the subdivisions mentioned, and the cost of lands purchased.^a

In conclusion your attention is invited to the fact that the expenditures of the bureau for the last fiscal year, ₱473,416.14, compared with the expenditures of the previous year, ₱241,436.88, show a very large increase, due mainly to the increase in the surveying and drafting force necessary for the completion of the friar-land surveys and for public land surveys. A further increase in this class of expenditures will occur during the coming fiscal year, and it is anticipated that the full force of surveyors and draftsmen authorized will be employed and the probable expenditure by the bureau will exceed ₱600,000. Thereafter either this figure will be materially reduced or the collections will be greatly increased.

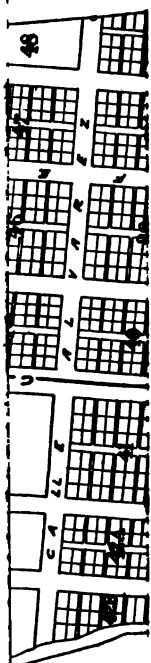
The total revenues of the bureau have also increased from ₱165,975.51 for the fiscal year 1906, to ₱282,620.14 for the fiscal year 1907, and a still greater increase is probable for the fiscal year 1908, both in receipts from public lands and from friar lands. This bureau does not now include in its actual receipts the amounts received from the San Lazaro estate, which are collected by the collector of internal revenue, and which, if included in the 1907 receipts, would increase the same to ₱336,087.51.

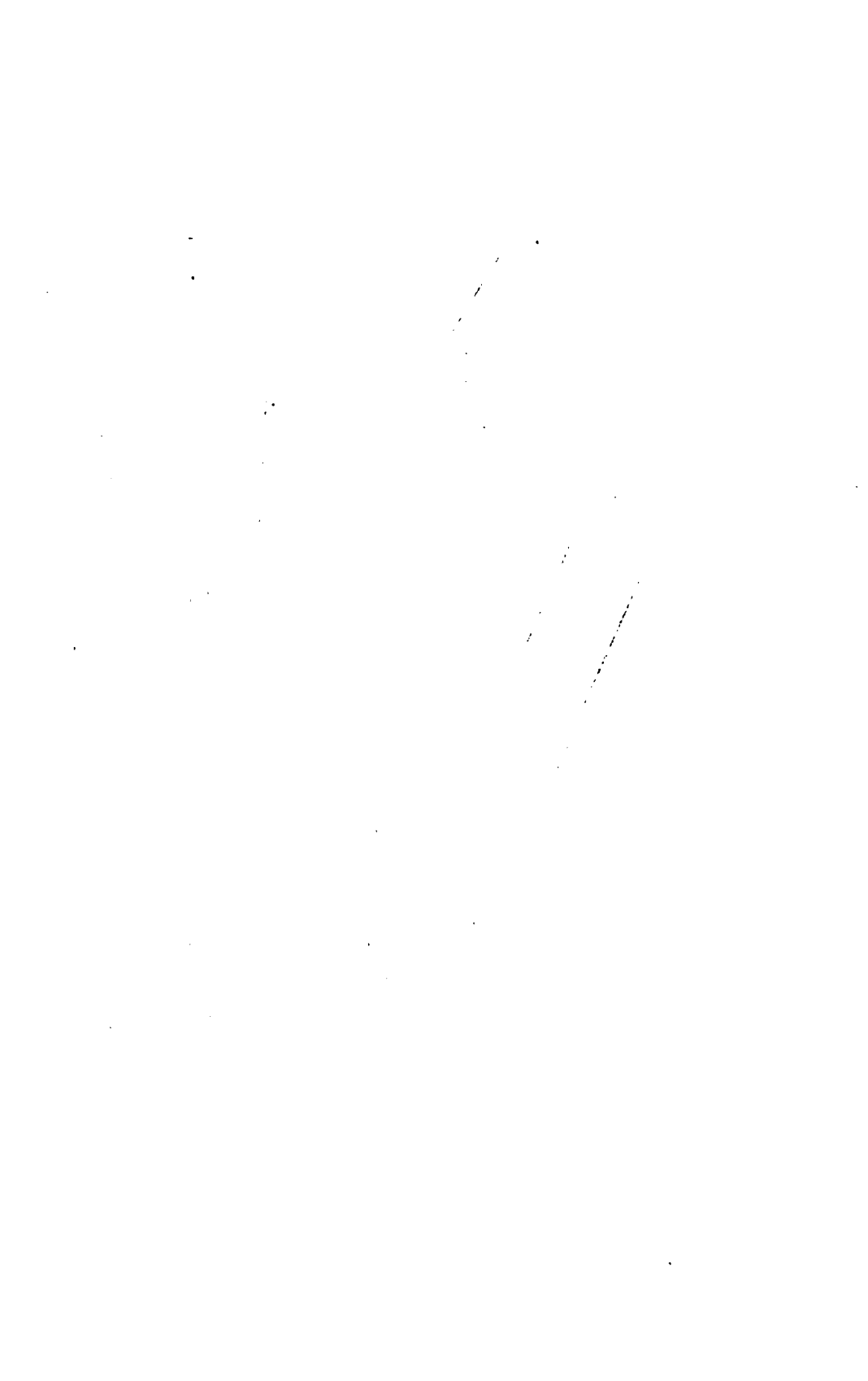
Respectfully submitted.

C. H. SLEEPER,
Director of Lands.

The SECRETARY OF THE INTERIOR,
Manila, P. I.

^a A statement of receipts and expenditures has been omitted and is on file in the Bureau of Insular Affairs, War Department.





APPENDIX F.

REPORT OF THE ACTING DIRECTOR OF AGRICULTURE.

MANILA, P. I., August 14, 1907.

SIR: I have the honor to submit herewith my report as acting director of agriculture for the fiscal year ended June 30, 1907.

ORGANIZATION.

The organization includes the three divisions: Administrative, plant industry, and animal industry.

ADMINISTRATIVE DIVISION.

The work of the administrative division includes the general administration of the central office of the bureau in Manila and of outlying experiment stations and stock farms; also such special lines of work as publications, crop reporting and statistics, steam plowing, etc., which do not properly come under the divisions of plant and animal industry.

PERSONNEL.

The director of agriculture was granted leave of absence with permission to return to the United States, and sailed from Manila on March 19, 1907.^a Since that time the assistant director has been performing the duties of the director, including the submission of this report. On account of this fact the matter herein contained will probably not be as full and explicit on certain questions which were handled entirely by the director as it otherwise would have been.

Some difficulty has been experienced in keeping the working force up to the desired standard. The meat-inspection law went into effect in the United States last year, the entrance salary of veterinarians was raised from \$1,200 to \$1,400, and there was a great demand for veterinarians of all grades on account of the increased number of positions. This affected the bureau of agriculture to the extent of taking away the entire veterinary force, except three men, in its employ one year ago. Every effort has been made to fill the vacancies, but so far only five veterinarians have been induced to come out from the United States. Cable advice has been received from Washington that only three additional veterinarians are available for appointment. The salaries offered by this government would appear to be adequate, but the very bright business outlook in the United States, the ease with which veterinarians secure employment in the Bureau of Animal Industry, and the handsome returns secured by private practice all combine to prevent men of this profession from coming to the Philippines.

The six agricultural inspectors provided for in the appropriation for the current year were appointed, and arrived here during the months of November and December, 1906. They were given a preliminary period of instruction in the work which they were expected to perform in the provinces, especially in the suppression of infective animal diseases, and assigned to their several stations about January 1.

It seems very desirable to increase the number of veterinarians, inspectors, and assistant inspectors, so that there shall be at least one veterinarian, inspector, or assistant inspector for each province and important island in the archipelago. It is imperative that those who are sent to suppress outbreaks of infective animal diseases arrive on the spot promptly before the disease has

^a The resignation of Prof. W. C. Welborn, director of agriculture, was cabled from Washington July 18, and accepted effective June 3, 1907.

had time to spread, and the nearer the man is to the location of the outbreak the easier it becomes to reach there promptly.

A requisition was placed with the bureau of civil service on March 23, 1907, for a stenographer at \$2,400 per annum. This addition to the clerical force has seemed imperative, and yet we have been advised month after month that no additional stenographers were available. This probably indicates that the salary offered is too low, and that we shall have to increase the pay or fill the position with a lower grade employee.

It is necessarily a difficult matter to secure from the United States persons who are qualified to enter at once into active service in tropical agriculture. In this connection the assistance and cooperation of the bureau of civil service has been of great value.

The native clerical force is increasing in efficiency year by year, and it now seems probable that this branch of the force can be increased and the number of higher priced American employees gradually decreased, thereby economizing in the cost of clerical work. It is recommended that a number of native clerks heretofore working as temporary employees be appointed permanently in the classified service.

The year shows a net loss of five classified employees.

PUBLICATIONS.

During the year the following publications have been issued :

Title.	Author.	Issued.	Language.
FARMERS' BULLETINS.			
No. 13.—El Cultivo del Maguey en las Islas Filipinas (reimpreso).	H. T. Edwards.....	Aug. 27, 1903	Spanish.
No. 14.—El Cultivo del Sesamo en las Islas Filipinas.	Wm. S. Lyon.....	Aug. 29, 1906	Do.
PRESS BULLETINS.			
No. 8.—Maguey, Propagating Abaca from Seed, etc.	H. T. Edwards.....	Nov. 9, 1906	English.
No. 9.—Bureau of Agriculture Districts of the Philippines, Control of Rinderpest, etc.	G. E. Nesom.....	Feb. 5, 1907	Do.
No. 10.—The Weevil Pest and Its Remedy, Maguey, etc.	H. T. Edwards.....	Apr. 24, 1907	Do.
No. 10.—La Plaga de Gorgojos y su Remedio, Maguey, etc.	.....do.....	.....do.....	Spanish.
CIRCULARS.			
Instructions for Planting Field and Garden Seeds.	Wm. S. Lyon.....	July 19, 1903	Do.
Maguey.....	H. T. Edwards.....	July 27, 1906	English.
Do.....	.....do.....	.....do.....	Spanish.
Do.....	.....do.....	.....do.....	Ilocano.
Do.....	.....do.....	.....do.....	Tagalog.
Do.....	.....do.....	Sept. 12, 1906	Boholano.
Do. (reprint).....	.....do.....	.....do.....	Tagalog.
Do. (reprint).....	.....do.....	.....do.....	Spanish.
Do.....	.....do.....	Nov. 8, 1901	Masbate.
Do.....	.....do.....	Apr. 24, 1907	Cebuano.
Do. (reprint).....	.....do.....	May 16, 1907	English and Spanish.
No. 1.—Crop Reporting Service.....	.....do.....	Nov. 11, 1903	Spanish.
Do.....	.....do.....	.....do.....	English.
Instructions for Planting Field and Garden Seeds (reprint).	Wm. S. Lyon.....	Mar. 19, 1906	Spanish.

There is a constantly increasing demand for publications on agricultural subjects and extensive distributions of our bulletins have been made within the year.

Our press bulletin has grown to such proportions that with the addition of the statistical division and crop-reporting service it might well be further enlarged into a monthly publication, to be issued and circulated as a periodical.

The circular on maguey was published in the languages of those provinces and islands where existed the greatest interest in this subject. This circular has accomplished excellent results, and it is safe to say that of all the crops gen-

erally advocated for the Philippines none has created up to this time the same interest that has been manifested in maguey. This fact has suggested the desirability of issuing similar circulars on such other subjects as kapok, corn, rice, pineapples, cacao, and sesamum, and all of the infective animal diseases prevalent in the islands.

The mailing list of the bureau has been revised, so as to avoid sending bulletins and other publications to persons who would not receive and make good use of them.

CROP REPORTS AND STATISTICS.

ORGANIZATION.

In the annual appropriation for the current fiscal year provision was made for a statistician, whose duty it should be to organize and give constant supervision to a crop-reporting service throughout the islands, and so record and classify the statistics thus obtained that they should be available for reference and publication.

On October 1, 1906, Mr. B. L. Moss was appointed to this position, and began at once the organization of the work. On October 29 he presented a report and recommendation to the director of agriculture in which a proposed plan of organization was given. The proposed work of this division, briefly stated, was to obtain regular and reliable information relative to crops and live stock in all parts of the islands; to summarize and tabulate this information so that it may be in the highest degree useful and available, and to publish such part thereof as may seem desirable.

In order to obtain the information required it was proposed to organize a crop-reporting service with a corps of municipal, provincial, and district reporters, the latter to be our agricultural inspectors, who were also to have a general supervision of the work of all other reporters. Each one of these reporters was to furnish a regular monthly and annual report on the agricultural conditions within his municipality, province, or district, to be made out on forms furnished by this bureau. This service, except in the case of our regularly appointed inspectors, was to be gratuitous. The crops to be reported upon were abaca, maguey, sugar, rice, copra, and tobacco. The information to be furnished regarding these crops included the area planted and harvested, condition and value of crops, etc. The live stock to be reported upon included horses, cattle, carabaos, goats, sheep, and hogs. The information to be furnished regarding live stock included the number and condition of animals, increase and decrease, number of cases of disease, and nature of disease.

BUREAU OF AGRICULTURAL DISTRICTS.

It had been planned to divide the entire archipelago into districts, in each of which should be stationed at least one veterinarian and one agricultural inspector or assistant inspector. It was arranged that, when opportunity permitted, the representatives of this bureau, especially the agricultural inspectors, should employ their time in personally organizing and supervising the crop reporting service.

The bureau of agriculture has established nine agricultural districts, including all provinces and important islands, as follows:

District No. 1.—Cagayan, Isabela, and Nueva Vizcaya; headquarters, Tuguegarao; substation, Ilagan.

District No. 2.—Ilocos Norte, Ilocos Sur, and La Union; headquarters, Vigan; substations, Laoag and San Fernando (La Union).

District No. 3.—Pangasinan; Benguet, Lepanto-Bontoc, and Tarlac; headquarters, Dagupan; substations, Bagulo, Cervantes, and Tarlac.

District No. 4.—Zambales, Bataan, Pampanga, Nueva Ecija, La Laguna, Rizal, Manila, Cavite, Batangas, Tayabas (part on west coast), Mindoro, Palawan, Marinduque, Romblon, and Bulacan; headquarters, Manila; substations, Iba, Lamao, San Fernando (Pampanga), San Isidro, Batangas, Lipa, Lucena, Santa Cruz (La Laguna), and Alabang.

District No. 5.—Ambos Camarines, Albay, Sorsogon, Masbate, and Tayabas (part on east coast); headquarters, Legaspi; substations, Nueva Caceres, Sorsogon, and Masbate.

District No. 6.—Samar and eastern Leyte; headquarters, Tacloban; substation, Catbalogan.

District No. 7.—Cebu, Negros Oriental, Bohol, Misamis, Surigao, and western Leyte; headquarters, Cebu; substations, Tagbilaran, Dumaguete, Cagayan, and Surigao.

District No. 8.—Iloilo, Capiz, Antique, and Negros Occidental; headquarters, Iloilo; substations, Silay, La Carlota, and Capiz.

District No. 9.—Moro Province; headquarters, Zamboanga; substation, Davao.

SUBSEQUENT OPERATIONS.

The annual report form for the calendar year 1906 was prepared and sent out to all correspondents who, up to January 1, had been engaged to undertake the work. The preparation of reports was not fully understood by the correspondents, and after a wait of 30 days only a few dozen reports had been filled out and returned. On February 1 Mr. Moss was granted leave of absence with permission to visit the United States, and from that date to the close of the fiscal year Mr. H. T. Edwards was in charge of this work. Much of the remainder of the fiscal year was spent in corresponding with provincial and municipal authorities with a view to securing their hearty cooperation in this work, and the agricultural inspectors and other employees of this bureau in the provinces visited many different municipalities for the purpose of arranging personally with correspondents who would furnish us with the desired information.

A number of circular letters were sent out and the correspondence involved has been necessarily very extensive. A system of filing and indexing the reports received was effected and blank forms were prepared for tabulating all of the statistics obtained.

All of this work has taken much time and patience, but the results obtained have been fairly satisfactory.

PROGRESS OF THE WORK.

The establishment of an efficient crop-reporting service in a country like the Philippine Islands, where agriculture is comparatively undeveloped and transportation facilities are limited, is necessarily slow work. In view of the conditions above mentioned, it is considered that the progress made is most encouraging. On January 1 the service was in process of organization. At that time we had no reporters and had received no reports. On June 30 we had a corps of 370 municipal reporters, representing 308 municipalities, or nearly one-half the total number of municipalities in the islands, and had received a total number of 1,628 reports. It is believed that the practicability of establishing a crop-reporting service in this country has been fully demonstrated, and that this service can be extended during the present year so as to include every municipality in the archipelago.

We now send every month to each reporter a printed form for the report, a stamped return envelope, and a circular or circular letter on some agricultural subject of current interest.

QUALITY OF REPORTS.

The primary requisites of an efficient crop reporter are that he shall prepare accurate and complete reports, and shall forward these reports regularly and promptly. The preparation of satisfactory crop reports requires a certain amount of experience and training, and all of our reporters are as yet new to the work. We receive many excellent reports and others that might well be improved. The quality as a whole is very good, and it is only reasonable to suppose that it will improve as our reporters become accustomed to the work and gain more experience. They are not received as promptly as might be desired, but improvement in this direction is noticeable from month to month.

COMPILATION OF REPORTS.

Up to the present time no attempt has been made to compile or tabulate the statistics received. The necessary forms for this tabulation have been prepared and are now in the hands of the printer. As soon as they are received this work can be taken up.

PUBLICATION OF REPORTS.

An essential part of a crop-reporting service is the prompt publication of the data received. This work can not be satisfactorily done until the service is fairly well established. Up to the present time the only crop-service data published have been a few brief reports on agricultural conditions in the provinces. This service now furnishes sufficient material for a monthly "Crop Reporter," and such a publication would greatly increase the efficiency of the work.

PRACTICAL RESULTS OF THE CROP-REPORTING SERVICE.

The collection of statistics and information regarding agricultural conditions throughout the islands is a most important line of work, but of even greater importance is the fact that the crop-reporting service brings the bureau into direct touch with the farmers of every municipality where we have a reporter, not occasionally and infrequently, but regularly every month. The reporter is, in a certain sense, the representative of the bureau of agriculture in the municipality. He knows what the bureau is in a position to do for the farmers, and the needs of the farmers in his particular municipality. The greatest obstacle in the way of improvement of agricultural conditions in the provinces is to get in touch with the average Filipino farmer. The crop service offers a simple and practicable means of bringing this about.

In connection with the monthly reports we receive many requests for seeds, plants, and publications, and for assistance in the work of stamping out infective animal diseases and destroying pests. As our reporters become better acquainted with the work and when, through the monthly reports, we know more about the actual conditions in each municipality, this work can be largely extended.

PUBLIC SERVICES.

SEED AND PLANT DISTRIBUTION.

EXTENT.

Interest in the seed distribution remains unabated. The number of applicants for seed is increasing, and the amount of seed sent out has exceeded that of any previous year. A gratifying feature of this work has been the largely increased number of applications for farm seeds. During the fiscal year ended June 30, 1907, 42 per cent of all the collections issued were farm seed as compared with 20.5 per cent for the previous year.

The total distributions of farm and garden seeds during the year have been as follows: Farm seeds 2,184 collections, each of which contained one or more kinds of seed; garden seeds 3,763 collections, averaging 8 packets of seed to each collection. These were sent to 3,078 different persons in 519 different municipalities and barrios. This distribution included every province in the archipelago. In addition to seeds sent out, 1,361 packets of garden seeds were given to people who called at the office of the bureau in Manila.

CLASSES OF SEEDS AND PLANTS DISTRIBUTED.

The various seeds and plants distributed during the past year may be classified under the following heads:

1. General farm crop seeds.
2. Maguey plants.
3. Garden vegetable seeds.
4. Flower or ornamental plant seeds.

General farm crop seeds.—Distributions of farm seeds of especial interest were field corn, sesamum, Carolina golden rice, and peanuts. A considerable amount of the corn distributed was produced at the Singalong experiment station where, for the first time, we succeeded in raising seed corn that was, in all respects, fully up to the standard of the type procured from the United States. A part of the sesamum seed distributed was acquired by purchase and a part was donated by M. Edouard Vidal, of Manila, who selected this bureau as the medium for the widest and most effective distribution of this valuable oil seed.

Our experiences and those of others have been generally good with broom corn, field corn, cowpeas, velvet bean, Kafir corn, sorghum, rice, and sugar cane. Of cotton, teosinte, and the new varieties of tobacco and peanuts, we

have not yet received reports sufficient to justify conclusions. Barley and oats fall to produce grain and indicate usefulness as forage plants only at high altitudes. Alfalfas and clovers in the lowlands have invariably died out, even where the soils were inoculated with the specific bacteria called for by each species. At high elevation sufficient success has been attained to justify further experimental work with these plants. Rape and rye have been tried only at La Trinidad, and data of results obtained have not yet been received.

Maguey plants.—The distribution of Hawaiian sisal plants has had three direct results: It has introduced into the islands an improved variety of maguey, has furnished a supply of plants in localities where Philippine maguey could not be obtained, and has greatly stimulated the planting of our local maguey.

The first lot of 50,000 Hawaiian sisal plants was received in Manila in July, 1906. They were distributed in 8 provinces, largely through the provincial governors.

The second lot of 50,000 plants was received in August, 1906. They were distributed in 18 provinces, both through provincial officials and direct to the farmers.

The third lot of 120,000 plants was received in November, 1906. Of this shipment 15,000 were sold to the Moro Province at cost price, 10,000 were furnished the bureau of lands for distribution on the friar estates, 5,000 were planted at the Lamao Experiment Station, and the remaining 90,000 were distributed in 33 different provinces. The total number of Hawaiian plants received and distributed during the year was 220,000. In a majority of cases these plants have been distributed through provincial governors, teachers, and other responsible persons. Our records show that 37 provinces and districts, 196 municipalities, and 502 individual farmers have received Hawaiian sisal plants. It has been impossible, however, to obtain complete data on this subject, and the ultimate distribution of these plants has been much more widespread than is indicated by these figures.

During the past six months we have received many reports stating that the Hawaiian plants have given entire satisfaction and numerous requests for more have been received.

On June 30, 1907, the total number of requests that had been received for maguey plants was 1,342. These requests were received from 43 provinces and districts and from 381 municipalities. In order to supply this demand for maguey plants an order was placed in February, 1907, with the Hawaii agricultural experiment station for 500,000 sisal pole plants, to be delivered in Manila during July and August of the present year.

Garden vegetable seeds.—Unqualified success has been reported from every province, excepting Samar, with beans, beets, cabbages, carrots, eggplant, mustard, okra, peppers, radishes, parsley, New Zealand spinach, tomatoes, and turnips. Sweet corn, American cucumbers, melons, watermelons, and squashes have been the subject of many conflicting reports, ranging all the way from "very good" to "complete failure." All persons who have had failures, except in growing corn, concur in attributing their losses chiefly to insect enemies, which through ignorance, apathy, or neglect to procure the proper remedies, have remained unchecked. Brussels sprouts, rhubarb, and French artichokes, so far as tried, have proved most unsatisfactory. Asparagus has made a very strong growth wherever planted, but since it has no winter resting period here it tends to produce small tips and a heavy growth of plume. Kohlrabi of excellent quality and size was grown by the bureau experimentally and is deemed worthy of considerable distribution. Celery has made good growth, but has so far resisted all attempts to blanch it without its rusting badly. American peas, if planted so as to mature in our coolest season, invariably fruit, but are not as prolific at low altitudes as could be desired. A few of the edible podded Japanese varieties gave heavy yields, and a large distribution of these varieties is contemplated.

Flower and ornamental plant seeds.—Heretofore the bureau has not distributed flower seeds, but as there has been a constantly increasing demand for this class of seeds a small supply was purchased during the past year. These flower seeds have been distributed to 173 persons. The following varieties of flower seeds have been sent out: *Amaranthus*, *balsam*, *calendula*, *callopolis*, *cockscomb*, *marigold*, *portulacca*, *zinnia*, *nasturtium*, and *ageratum*. Excellent flowers of all of these, except the last two, have been secured. The failure of the last is remarkable for the reason that a closely allied species occurs as a noxious weed throughout the archipelago.

NATURE OF REQUESTS.

Two very gratifying features in connection with the seed and plant distribution during the past year are worthy of mention. One is the greatly increasing number of small farmers who apply at the office in person for seeds, and the other is the very marked increase in the number of applications which have been received from the provinces of Samar and Leyte. During the last few weeks of the year there were received a large number of requests from these two provinces for both field and garden seeds. This seems to have resulted directly from the restoration of peace in these two provinces, and shows that the people there are now resuming their normal occupations on the farms.

PROPOSED CHANGES.

During the past two years only one distribution of seeds has been made each year, this distribution beginning the latter part of September and lasting through December. At this period of the year conditions prevailing on the west coasts of most of the islands are best suited to gardening and farming operations. There is a small demand throughout the year, especially from Americans and school children, but on account of the difficulty of keeping seeds in satisfactory condition many of these requests have been held over for the dry-season distribution. Now that there is a growing demand on the east coast of those islands, where the seasons are the reverse of those on the west coast, it is thought that a return to the custom of making two seed distributions per annum will be demanded. Two distributions each year will necessitate two importations, for the reason that seeds deteriorate rapidly in this country. The difficulties of keeping seeds in perfect condition in these islands are sufficiently great at best, and it would be inviting certain failure to attempt the distribution of seeds which had been kept on hand a number of months.

STEAM PLOWING.

LANDS PLOWED.

In November, 1906, the large steam plow formerly used at the Murcia rice farm was shipped to the Santa Rosa friar estate, with a view to its use in plowing the lands formerly cultivated in sugar on that estate. These lands have been abandoned for about ten years, have become overgrown with a dense growth of the native grasses, talahib and cogon, as well as occasional spots of timber, so that it is almost impossible to break them again with farm animals. There are two classes of land on this estate. The lowlands along the lake shore are of a sandy nature, intermixed with silt brought down by the small streams originating in the near-by mountains. These are generally cultivated in rice, and are so covered with dikes for retaining the irrigation water that it is impracticable to plow them with a steam plow. The foothills lying between the lowlands and the mountains are of a gentle, rolling nature, and of black volcanic formation. There is occasionally a sandy spot or a hill, on top of which there is a heavy layer of reddish iron-ore gravel, but in general the soils are black in color, of fine texture, and quite pasty when wet.

OBSTACLES.

An effort was made to use a steam gang consisting of six 14-inch share plows of the sandy land type, the only plow of this kind owned by this bureau. As was predicted, it would not turn the soil and was soon pronounced a complete failure. An effort was then made to use an 8-disk steam gang. This worked fairly well where the land was sandy, free from grass and trash, and especially where it had been broken once. However, land once gotten into this condition is easily plowed by the use of farm animals, thus obviating the necessity for a steam plow. As this gang was to all intents and purposes a failure, a series of investigations followed in an effort to find a plow which would do this work properly. The result was the building of two gangs carrying 8 and 12 disks, respectively, and a middle breaker each. These gangs have extra heavy frames, triangular in shape, and the drawbars are attached to the base of the triangle. The middle breaker, with a heavy wheel in the rear, is at the apex of the frame. An equal number of disks are set on each side, one half of them turning the dirt in one direction and the other half in the opposite direction. Each gang has 3 wheels, all of which are adjustable by levers, and are used for regulating the

depth of the cut. The large gang cuts a swath 12 feet wide, or $4\frac{1}{2}$ feet more than the gang of 6-share plows, and is apparently drawn by the 35-horsepower engine as easily as the latter. The small gang cuts about 8 feet and was made for the 18-horsepower thrashing engine, which has been sent to Santa Rosa from Cavite Province. It has, however, proved too heavy, and two of the disks have been removed, thus decreasing the cut to about $6\frac{1}{2}$ feet. Both gangs have been pronounced, by the farm machinery expert of this bureau, a decided success, and while the most valuable part of the dry season for steam plowing was consumed in making the experiments, it seems probable that we are now prepared for such plowing as may be demanded in the future. Many difficulties have had to be met and overcome in connection with steam plowing, among which is the inability of the landowners to do a reasonable part in connection with the work and the necessity for accomplishing practically everything at government expense. It was originally intended that the landowners should furnish the labor, haul the water, and furnish the fuel, which latter was to consist of dry wood cut in the vicinity. The labor they have furnished has been quite unsatisfactory, because most of the plowing is being done quite a distance from where any people live. The laborers have not as a general rule camped with the plowing outfit, but have returned to their residences in the barrios at night, and have been correspondingly late reporting for duty the following morning. Animals for hauling wood and water have been quite scarce, and the available supply of dry wood was soon exhausted. It is not practicable to cut and cure wood except in the dry season, and as this work has been neglected, the continuation of plowing operations with only wood as a fuel seems impracticable. Realizing these difficulties, the landowners sent a delegation to Manila with a request that the government supply the necessary fuel and charge it as a part of the expense of plowing the land. The price at which this bureau agreed to plow the land with labor, fuel, and water furnished by the landowners was ₱5 per hectare. To furnish coal as a fuel for this plowing will practically double the expense, and as it will also be necessary to put a trained force of hands paid and subsisted by the government on each of the plows, it is feared that steam plowing will cost more than the landowners will feel justified in paying.

PROSPECTS.

There has been a constant demand for steam plowing on other friar estates and private lands in the provinces lying near Manila. It is not thought wise to encourage the people to believe that this work is an entire success, in view of the difficulties which this bureau has had to contend with during the past year. If the infective animal diseases constantly destroying the domestic animals used for draft purposes on the farms could be placed under control, even to the extent of making it reasonably safe to import cattle, it is probable that plowing with animals would be a better method of reclaiming the uncultivated lands than to freely advocate steam plowing.

ADVICE.

A number of trips of investigation have been made by the assistant director to the different friar estates and several private haciendas for the purpose of advising the landowners relative to improvements on the same. One trip made to the Imus estate, where there was considerable demand for steam plowing, developed the fact that there was no road over which a steam plow could be taken before reaching the lands where the plowing was desired, and that possibly three-fourths of these lands were overgrown with timber and brush to such an extent that the operation of a traction engine was practically out of the question. The owners were furnished with stump pullers, advised to clear the land from timber, and make an effort gradually to bring it into cultivation by means of domestic animals.

A trip was also made to the friar estates lying immediately northeast of Manila, with a view to investigating the character of the land, that recommendations might be made regarding the most desirable crops to be planted there. These estates are not, as a general rule, adapted to the growing of rice and sugar cane on account of the extremely shallow soil and scarcity of irrigation water. They are, however, admirably adapted to the growing of maguay, kapok, ilang-ilang, and such other crops as are not exacting in the matter of soil and water.



PLATE 1. THE COCOANUT (*COCOS NUCIFERA* LINN.).
(A staple crop in the Philippines.)



PLATE 2. BREAKING COGON SOD WITH STEAM FLOW.



PLATE 3. PLOWING RICE LANDS WITH NATIVE BULLOCKS AND AMERICAN GANG PLOW.



PLATE 3. PLOWING RICE LANDS WITH NATIVE BULLOCKS AND AMERICAN GANG PLOW.

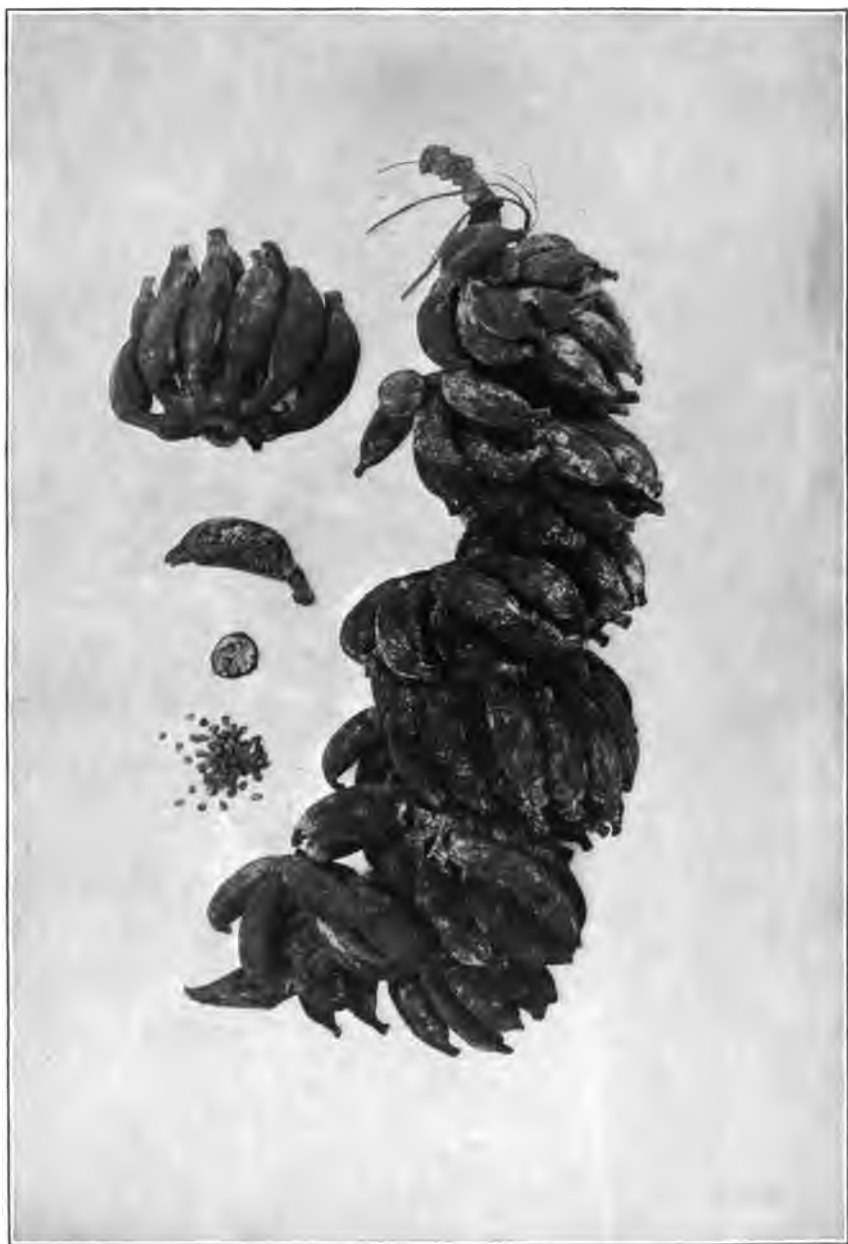


PLATE 5. ABACÁ FRUIT AND SEED.



PLATE 6. GUINEA GRASS, SHOWING NEW GROWTH TWO WEEKS AFTER CUTTING FOR GREEN FORAGE.



PLATE 6. GUINEA GRASS, SHOWING NEW GROWTH TWO WEEKS AFTER CUTTING FOR GREEN FORAGE.

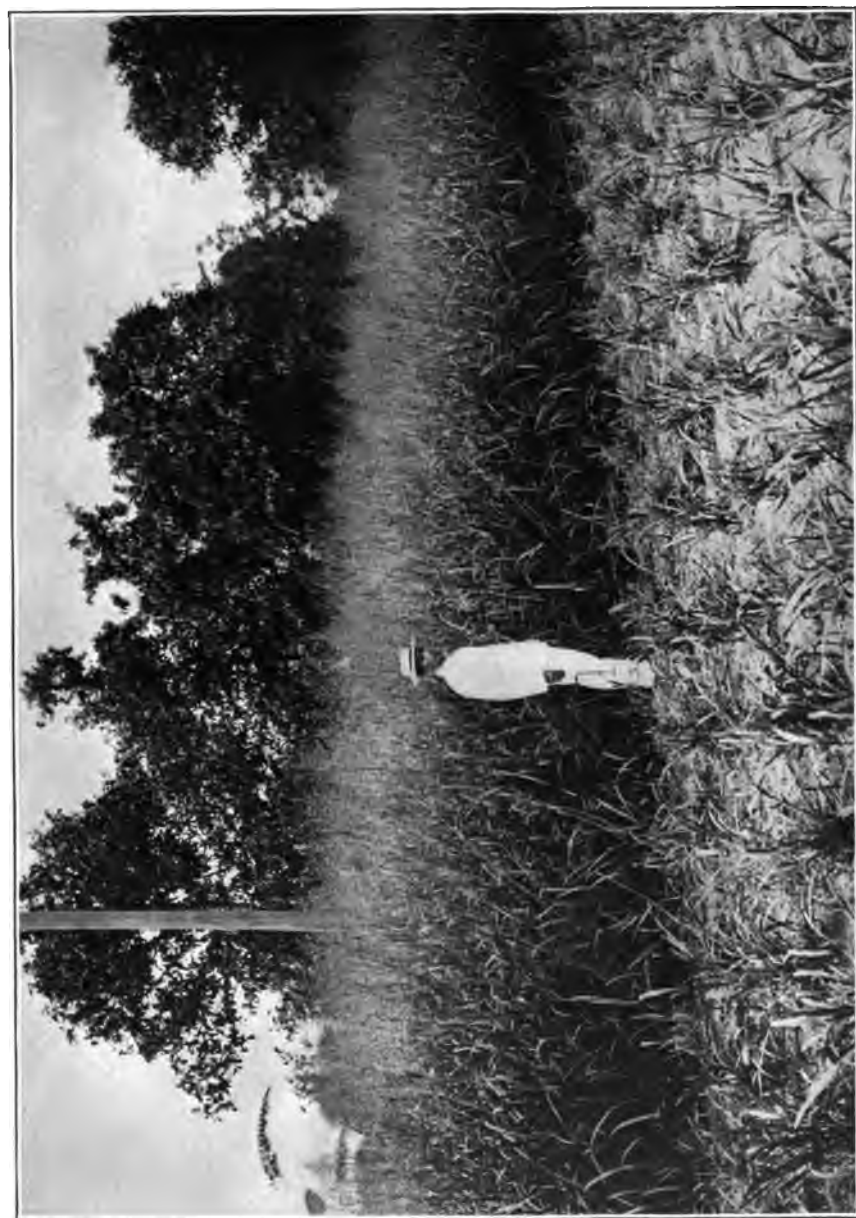


PLATE 7. GUINEA GRASS IN FLOWER AND SEED.

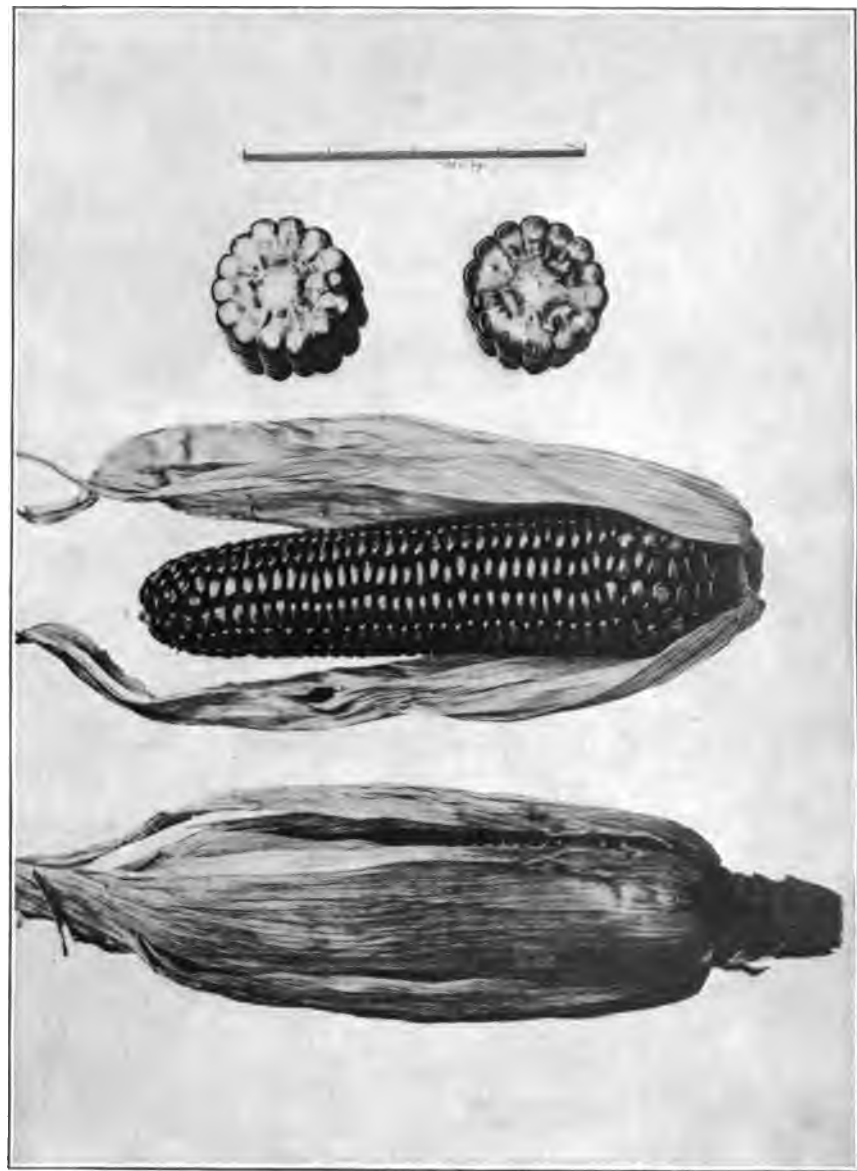


PLATE B. NATIVE FLINT CORN.



PLATE 9. SWEET SORGHUM AT THE SINGALONG EXPERIMENT STATION.



PLATE 10. YOUNG FLORIDA VELVET BEANS. GROWN IN VEGETABLE GARDEN TO ENRICH SOIL AND KILL NUT GRASS.



PLATE 11. NATIVE WHITE CASSAVA (MANAHOT UTILISSIMA). TREES IN BACKGROUND ARE CEARA RUBBER (MANAHOT GLAZOVII).



PLATE 12. NURSERY OF HAWAIIAN SISAL AT SINGALONG EXPERIMENT STATION. TWO TREES IN FOREGROUND ARE AVOCADO PEARS.



PLATE 13. COFFEE TREE IN FRUIT.



PLATE 14. THE ANONA (*ANONA RETICULATA*), SHOWING LEAVES AND FRUIT.

The Muntinlupa estate was visited in the month of October, 1906, and after a careful investigation recommendation was made that all of the unleased portion of this estate be surveyed into large blocks and offered for lease and sale for the purpose of planting maguay. This suggestion was adopted by the bureau of lands, and practically all of the land was leased by the end of the fiscal year.

LOANS OF ANIMALS FOR BREEDING PURPOSES.

The bureau of agriculture has continued to furnish American stallions, jacks, bulls, and boars for breeding purposes in the provinces. In many cases the number of services rendered by these animals has not been as large as could reasonably be expected. This fact has been due to several different causes, among which are the following: There is a notable lack of appreciation of the value of better blood. In some cases horses stationed in the best horse-breeding districts have had practically no service, while hundreds of mares in easy reach were running at large with a herd of horses containing numerous native stallions of all ages and qualities. In many cases the native owner of mares does not even take the pains to breed them to the best native ponies. During the year 11 stallions and 2 jacks have rendered 228 services. Of these, 1 Arabian stallion in a remote mountain district has served 62 mares, 2 in charge of the bureau have served 75, and the remaining 10 have served only 91, or an average of only a little over 9 each.

The groundless fear that native mares would not foal colts sired by larger horses has also continued to exert a bad influence. In other cases horses have been loaned to private parties, whose interest in their use did not extend beyond the breeding of their own animals, and under such circumstances no effort has been made to secure outside mares to be bred. There have also been circulated various rumors, such as the charging of extortionate stud fees, or the taking of part of the colts by the man having the horse in charge, all of which no doubt have had their influence in deterring those who might otherwise have patronized the horses.

A number of excellent colts have been reported during the past few months. No systematic inspection of the foals has yet been made, but this work will be undertaken during the coming dry season.

Three of the stallions have been taken out of private hands and placed in charge of employees of the bureau of agriculture. The persons having charge of these horses have been instructed to campaign them and to obtain, if practicable, full service lists for each one. It is believed that this method will give better results than any other, and that it should be adopted in the future, as the horses are liable to die at any time without having rendered a satisfactory amount of service. It will be somewhat expensive to handle the stallions in this way, but the good work they are capable of doing and the amount of money already invested in them are sufficient reasons to justify such expense.

There has been a constantly increasing demand for American and Australian bulls, and while but few have been furnished the past year, this is one line of public service which will be pushed in the future. A number of excellent young bulls are now being raised. All of these bulls have been or will be immunized to rinderpest and sent to provinces where their services are likely to be of the most value.

During the first five months of the year the prospects for a further distribution of Berkshire pigs seemed very bright, but on account of the advent of cholera among them the latter part of November the entire lot except 6 sows died. About four months' time was lost in obtaining another good boar from Australia, and it will be well into the next fiscal year before we shall have another lot of pigs ready for sale or distribution. There is a constantly growing demand for pigs, and while the people generally have no disposition to pay fancy prices for them there is a reasonable appreciation of the fact that well-bred pigs are superior to those of the native type.

We have also had a number of requests for the loan of Angora and Maltese milk goats, but up to the present time have been able to furnish only one Angora and two Maltese billies for public service.

There has been a small demand for poultry, which has generally been met by directing the inquirer to local dealers who have poultry for sale. As the few chickens still owned by the bureau of agriculture have been loaned to another bureau we have not been able to supply this line of live stock.

FARMS ABANDONED.

Two farms have been abandoned during the year. One of these was the dairy farm operated at San Juan del Monte, near Manila, where the dairy herd had been kept for a little more than two years. The area of land available at San Juan del Monte was small, very stony, rendered dangerous for cattle by the large number of stone quarries scattered over it; furthermore, the land was in litigation, and the courts have since decided that it is not the property of the government. The dairy herd was moved from there on December 29 to a place selected for a new dairy farm on the Muntinlupa friar estate, in the southern portion of Rizal Province.

The other farm that was abandoned was a tract of about 25 hectares of land on the Santa Cruz friar estate, in Cavite Province, which was under cultivation in rice. A part of this piece of land was plowed by means of a petroleum traction engine, which this bureau was testing, and the remainder was broken with the 18-horsepower threshing engine, which had been sent to San Francisco de Malabon in connection with the rice-threshing outfit belonging to this bureau. A strong prejudice had grown up there against the work of the threshing machine, which made it impracticable to operate it during the last harvest season. The exact cause of this prejudice is not known, but is reputed to be a superstition or belief that rice threshed on the machine is in some way injured, so that it produces a low-grade product in milling. It was not the intention of this bureau to plant the land plowed, but to lease it to small planters residing on the friar estate. As no applicant appeared to take it and as we had just imported a large supply of Carolina golden rice, it was decided to plant the same at Santa Cruz and to produce seed for distribution. It was not known at the time that the Carolina golden rice was a short-season variety and would not stand transplanting. The result was that, although the plants grew very rapidly in the seed beds, when transplanted they failed to recover from the dwarfing effect. The harvest was less than the seed sown and was pronounced a decided failure. At the same time a considerable quantity of this rice was sown in drill at the Singalong experiment station in thin, sandy soil and produced at the rate of 52 cavans per hectare without artificial irrigation. At the time the threshing engine was removed from Santa Cruz all of the machinery and implements used in the cultivation of the rice were shipped back to Manila.

NEW FARM ESTABLISHED.

One farm has been opened during the year. It is known as the Alabang stock farm, and when thoroughly equipped all of the live stock belonging to the bureau of agriculture, which has been kept in a number of places in and around Manila, will be taken to this farm.

MACHINERY INVESTIGATIONS.

The absence of the machinery expert of this bureau, who was in the United States from the beginning of the fiscal year until December, has seriously handicapped our machinery investigations. Some progress has been made, however, in this work.

ABACA MACHINES.

There has been more definite progress made during the past year in the work of perfecting and introducing abaca-cleaning machines than in any previous year in the history of the islands.

The development of the "Welborn-Bracy" abaca-cleaning machine, of which mention was made in the last annual report of the bureau of agriculture, has been continued by the company which controls it. The essential principle is that it cleans the fiber by means of knives on revolving wheels. A machine considerably larger than the original model has been designed, and the first of these larger machines was completed during the month of April. The weight is about 2 tons, its operation requires from 12 to 15 horsepower, and it can not be considered as belonging to the class of so-called "portable" machines. A contract has been let for the construction of 10 more, which are to be built in Manila, and the owners of this patent seem absolutely confident that they have a thoroughly reliable machine.

In October, 1906, a prospectus was issued by the proposed Manila Hemp Machine Company in which it was stated that the original Welborn-Bracy machine would clean 1,000 pounds of dry abaca fiber in ten hours. This clean-

ing capacity has not been fully realized, however, since the machine has been placed in the field. The engineer who has operated both the original and the improved machine states that the latter has been given a test run of eight hours, during which time 625 abaca stalks yielding 432 pounds of dry fiber were cleaned. This gives an average of 54 pounds per hour, or 540 pounds per day of ten hours. It should also be said to the credit of this machine that its capacity depends largely on the skill of the operators and that these results were obtained in a locality where labor is very scarce and inefficient and where many of the laborers had never before seen a machine of any kind in operation. The engineer claims that after this labor has been trained for three or four months he will be able to clean from 60 to 80 pounds of fiber per hour, or from 5 to 6 piculs per day of ten hours.

There has also been considerable development in the construction of abaca-cleaning machines which use the old principle of cleaning the fiber by means of a fixed knife. One company now has several such machines in operation in the Province of Albay. Another company, capitalized at ₱150,000, has been organized for the purpose of manufacturing and placing on the market a machine of this type. Several other different abaca-cleaning machines are either in course of construction or are ready for trial tests.

The bureau of agriculture has continued to furnish such assistance to the inventors and owners of abaca-cleaning machines as has been practicable. Raw material has been supplied for making trial tests, and these tests have been made, when so requested, under the supervision of the fiber expert. Samples of machine-cleaned fiber have been sent to many of the leading cordage manufacturers in the United States and reports and opinions regarding the fiber have been obtained. These reports indicate that there is no ground whatever for the belief that the fiber is injured by the machine during the process of cleaning.

KAPOK MACHINES.

A machine for cleaning kapok, designed by the assistant director, was partially constructed early in the year. This machine was a combination of the cotton gin and threshing machine. The work was discontinued to take up a method of cleaning kapok suggested by the director, in which a small portable threshing machine was used. This machine was modified by placing on it a suction feed which carried the kapok directly into the cylinder. The lint, seed, and burrs were, however, discharged together and much of the work of separation had to be done by hand.

MAGUEY MACHINES.

The large amount of maguey planted during the past year and the prospective development of this industry in the Philippine Islands indicate that there will be a considerable demand for maguey-cleaning machines in this country within the next two or three years. The greatest obstacle to the introduction of maguey-cleaning machines in the Philippines at the present time is the fact that our maguey industry is not sufficiently developed to use advantageously the large machines which are in general use on the plantations of Yucatan.

The bureau has furnished information in regard to the development of our maguey industry to the leading manufacturers of fiber-extracting machines in the United States, and advices have been received from one of these companies that a trial machine would be shipped to the islands. One of the small "Pioneer" sisal-cleaning machines was received by the bureau just at the close of the fiscal year, but it has not yet been placed in operation.

RICE MACHINES.

Three different kinds of cylinder rice hullers and polishers have been tried and the results have been quite unsatisfactory. It is probably not entirely fair to charge this failure to the machines, as they have been successfully operated in the United States and in a few cases in the Philippine Islands. The proper cleaning and polishing of the Philippine rice crop is quite a problem on account of the large number of varieties grown, the difference in size and texture of the grain, and the various methods of harvesting and handling. Enough information has been gained, however, to warrant the conclusion that burr hullers are better adapted to present conditions in the Philippine Islands than the more modern cylinder hullers.

BROOM-MAKING MACHINES.

The farm machinery expert of this bureau was instructed to investigate the broom-making industry during his vacation in the United States. The success already obtained in the growing of broom corn and the production of high-grade brush seemed to indicate that the manufacture of brooms could be made a profitable small industry here. During the time that our representative was studying the industry in the United States this subject was brought to the attention of persons here who were thoroughly conversant with broom manufacture. They at once took the matter up and began operations in a small way. Sample brooms of three grades have been received at this office and are unquestionably equal to any produced in the United States. There is not a very extensive market in the Philippine Islands at the present time for this kind of brooms, but the industry is one which can be enlarged by developing an increased demand for the product.

DIVISION OF PLANT INDUSTRY.

This division includes all general plant investigations, laboratory and field tests of seeds and the work done at the Singalong experiment station, Manila; the Lamao experiment station, Bataan; the Bagulo experiment station, Benguet; the La Carlota sugar farm, Occidental Negros; and the coffee experiments at Lipa, Batangas.

FIBER INVESTIGATIONS.

MAGUEY.

OUTLINE OF WORK.

The extension and development of the maguey industry has been an important line of work of this bureau during the past year. An attempt has been made to do four things: First, to show the farmers throughout the islands the value of maguey as a Philippine crop; second, to supply plants wherever they could be used to good advantage; third, to establish a nursery which should furnish a future supply of plants for distribution; fourth, to introduce into the islands a maguey cleaning machine suited to the conditions which exist here.

EDUCATIONAL.

Maguey is widely distributed throughout the islands, but a year ago the value of this plant was not generally understood, and, excepting in two or three provinces, but little of it was being planted. To-day there is not a municipality in the islands where maguey is unknown, and this crop has been, and is being, planted in every province where conditions are suitable for its cultivation.

Early in the year the bureau published, in English and Spanish, a bulletin on the cultivation of maguey in the Philippine Islands. Five thousand copies of this bulletin have been distributed. During the year we have published circulars on maguey in English, Spanish, Tagalog, Ilocano, Cebuano, Boholano, and Masbate dialects, 27,000 copies of which have been distributed. It is believed that this circular, which is a simple catechism on the elementary facts relating to maguey cultivation, has been most effective in producing results. In addition to general distribution, these bulletins and circulars have been furnished the bureau of education for use in the schools. This distribution of printed matter has been supplemented by a large amount of correspondence on the same subject, and many planters from the provinces have come to Manila and visited this bureau for the purpose of obtaining information regarding maguey. This educational work has prepared the way for the systematic extension of maguey planting in every municipality in the islands where this crop can be profitably grown.

ABACA.

ABACA WASTE.

During the year ending August 31, 1904, this bureau took up the question of the utilization of abaca waste for the manufacture of paper. Samples of this waste were collected and analyzed, and other samples were sent to a large number of paper manufacturers throughout the United States, France, and Great Britain. This waste was tested and reported upon by a number of

manufacturers, and considerable interest in the subject was aroused. This work has been continued up to the present time, and has also been the subject of extensive investigations by the bureau of science. As a result of these efforts a company has been formed for collecting and shipping this material, and abaca waste is now one of our export products.

FOREIGN MARKETS

The great bulk of the abaca produced in this country is shipped to foreign markets, and practically none of the producers of this fiber are in any way in touch with the manufacturers and consumers in the United States and Great Britain. As questions frequently arise relating to the quality of fiber received, the relative use of abaca and other fibers, and other allied subjects, it is desirable that such information be obtained from the manufacturers and brokers as may be of value to the Philippine farmers, and that we furnish the former with such information regarding the industry here as may be called for. This work has been carried on as in previous years by means of correspondence, reports, and samples sent to and received from the leading manufacturers and fiber brokers in the United States and Great Britain.

PROVINCIAL INVESTIGATIONS.

In October, 1906, the fiber expert made a trip through Albay, Ambos Camarines, and Sorsogon principally, for the purpose of making stripping experiments with different varieties of abaca. Several of the largest plantations in these provinces were visited, and 11 stripping tests were made. The time allotted for this trip was insufficient to allow of thorough work being done in any one province, and the almost continuous rains greatly interfered with the drying of the fiber that was cleaned. Considerable information was obtained, however, and this work is to be continued during the coming year.

A thorough investigation of the leading varieties of abaca in all of the more important abaca-producing provinces should be a work of great value. At the present time we know that the fiber of one province sells for ₱16, and that of another for ₱26, but to what extent the quality of fiber produced is affected by the variety of plant grown is not fully known. If we have certain varieties greatly superior to others which are in general cultivation the fact should be known and these superior varieties given wide distribution. Such an investigation will require considerable time, as we have dozens of different varieties of abaca, scores of local names, and practically no reliable botanical data regarding abaca on which to base these investigations.

GROWING ABACA FROM SEED.

The growing of abaca in commercial quantities from seed has an important bearing on the industry, on account of the limited supply of abaca suckers in certain provinces. In Mindanao some planters report the demand so great that they are finding it more profitable to sell abaca suckers at prevailing prices than to grow the plants for fiber. Of three lots of seed obtained the past year, two large lots proved defective—less than 1 per cent germinating. From a small (150 grams) sample the very good germination of 60 per cent was obtained. The high winds of the dry season scorched and killed off many of the young plants, but 700 survived, were twice transplanted, and then sent to the Lamao station in Batana for permanent planting. At the time of removal the stems of these seedlings averaged 3 feet 6 inches in height, and were correspondingly stocky and vigorous. The seeds were planted October 14, 1906, and the plants set out permanently June 1 of the present year, thus demonstrating that abaca plants may be obtained from seed in seven and one-half months. Some plants that were slightly protected were of suitable size for permanent planting inside of six months from time of seed sowing. The soil and climatic conditions in Manila where these experiments were conducted were exceptionally bad, and there is no doubt that under favorable conditions the results, including germination, would be much more satisfactory. The procuring of seed is sometimes a matter of much difficulty, as abaca plants are usually cut before the seed matures. Planters who desire to follow this method of propagation can do so by reserving a few fully mature stools of the plant which will produce all the seed required.

KAPOK.

ESTABLISHMENT OF EXPORT TRADE.

We have found in the case of abaca waste that when a demand for this material was created the establishment of an export trade soon followed. It is believed that the same will be true of kapok, and with this end in view we have been in correspondence during the past year with a number of the leading buyers of kapok in the United States.

Samples of Philippine kapok have been sent to these parties and the reports on these samples have in general been very favorable. The latest report received states that well-cleaned Philippine kapok would be marketable in New York City at 14½ cents United States currency per pound. The firm making this report states that it would be prepared to make a contract for all the kapok that the Philippine Islands could produce. Another firm in the United States, with which we have been in correspondence, has recently placed a preliminary order for a ton of Philippine kapok. The export trade in kapok is now handled by two reliable business firms in Manila, to whom are referred such inquiries as we receive on this subject.

LOCAL DEVELOPMENT.

The development of the kapok industry in these islands calls for two things—the saving of the large quantities of kapok now allowed to go to waste and the increased planting of trees. The value of this fiber is not generally understood throughout the provinces, and there is great need for educational work. Arrangements have been made for carrying on such work along the same lines that have given satisfactory results with maguey. A circular, giving concise and elementary information in the form of a catechism, has been prepared. This circular will be published in English, Spanish, and the more important Philippine dialects, and will be widely distributed throughout the islands. In connection with this work, kapok seeds and plants will be distributed to all persons requesting the same.

MISCELLANEOUS FIBER PLANTS.

There are a great many different plants in the Philippine Islands which yield fibers that would be of value if produced in large quantities and their use once established. The fact remains, however, that any attempt to introduce a fiber that is not already well known in the commercial world is a slow, costly, and, ordinarily, an unprofitable task. We receive many samples of such fibers with inquiries as to their value and possible utilization. Where these samples are of such quality as to justify such action, they are forwarded to fiber brokers in the United States and Great Britain and reports obtained.

Very excellent specimens of "Anabo" (*Abroma augusta*) have recently been received from the province of Iloilo, and have been forwarded to the United States for examination. This is one of our promising local fiber plants, as it is widely distributed in the islands, requires little cultivation, and produces a fiber of fairly good quality.

Specimens of "Sunn hemp," grown at the Singalong experiment station, were forwarded to American manufacturers earlier in the year, but the reports received were not of such a nature as to encourage the further cultivation of this plant.

With conditions favorable for the production of abaca, maguey, and kapok, for which there is practically an assured demand at good prices, it is believed that the cultivation in more than an experimental way of other fiber-producing plants that are not so well known should not be encouraged.

FIBER EXHIBITS.

On February 13, 1907, we forwarded to the Pacific Commercial Museum, in connection with a general exhibit of agricultural products, an exhibit of Philippine fibers and fiber products. This exhibit included 10 sample bales of abaca, showing the fiber of different provinces; 22 specimens of abaca from the Moro Province; selected samples of machine and hand cleaned abaca and maguey; kapok, cotton and cocoanut fiber, and a very fine collection of textile fabrics.

We have received during the year a collection of abaca samples from the district of Davao, and other samples of minor importance.

SEED AND PLANT INVESTIGATIONS.

SEED PRESERVATION EXPERIMENTS.

Some original laboratory work has been carried on during the year in the preservation of seeds. The results already achieved promise to solve a problem which for many years has been vexing importers and handlers of seed in all hot countries where the minimum atmospheric humidity never falls below 55° and the mean normal for one-half the year approximates 85°. Hermetical sealing, while a protection to the seeds in transit, is of no assistance after arrival unless the seeds can be disposed of as soon as opened, which is of course impracticable for merchants and others handling seeds in large lots. The difficulty of preserving the vitality of seeds in this country is indicated by the fact that peas, which on arrival from the United States gave us an 84 per cent germination test, failed entirely thirty days later. Corn, cotton, and other oily seeds have deteriorated within three weeks.

The experiments described below were conducted with a lot of very fine American corn seed received here early last December, and which showed the remarkably good germination average of 95 per cent. The object of these experiments was to determine the value of the method of keeping seed in hermetically sealed jars, as compared with the method used in this bureau. Three 2½-pound lots of the corn were taken at random from the shipment. One lot was placed in an ordinary metal seed cannister with a reasonably close-fitting cover. A second lot was placed in a glass jar provided with a close-fitting ground-glass stopper and at once hermetically sealed with melted paraffin. The third sample was put in a similar jar, in which had been placed an inch of coarsely broken charcoal that had just been exposed to a heat high enough to expel the moisture. While the charcoal was still warm, the corn was poured in and the whole topped off with another inch of charcoal. While still open it was exposed for thirty minutes to a gentle heat (43° C.) and then carefully sealed. This was on December 23, 1906. On May 23 of the present year (six months later) the two jars were opened, and 100 seeds taken from each, a like number from the closed cannister, and all were placed in the germinators. These tests were concluded on June 1, and we obtained from the heated jar containing the charcoal a 91 per cent germination, from that only hermetically sealed a 28, and from the cannister a 36 per cent germination. The tests were sufficient to demonstrate that hermetical sealing, unless precautions are taken to expel the very moist atmosphere, is detrimental rather than beneficial to the seeds. The unusually good showing (36 per cent) of the unprotected seeds was due in part to excellence of vitality at the start, and still more to the abnormally low reading of the hydroscope and the high, dry winds which marked the first quarter of the present year. Since the beginning of the wet season, however, the exposed corn has deteriorated more rapidly than that which was merely sealed. At the conclusion of the tests the heated corn was treated anew in the same manner and will be kept for future tests of this method. The average life of most garden and field seeds in temperate climates, without other provision than a cool, clean, dry bin, is four years, the extremes being two to ten years. These tests demonstrate the possibility of preserving all seeds even under the trying conditions which prevail in these islands. It is obvious that the importation of seeds of good quality is an indispensable factor to successful preservation, and that the cost of the method of seed preservation herein described would be great for large quantities of seeds, as they would have to be placed in small jars and much charcoal would be required. Large containers might be used, but as it would be difficult to fully exhaust the damp air and to promptly seal such containers, the danger of loss would be increased. The tests which we have made indicate that seeds from temperate countries can be preserved in the Tropics by the method described, although the use of this method on a commercial scale may not always be practicable.

SEED TESTING.

Our seed distribution began October 10, 1906, and all seeds were tested prior thereto. Most of the small seeds were received from Europe and came packed in hermetically sealed zinc cases. A number of varieties of peas, beans, and corn were received from American dealers and came in empty spirit casks.

Of the 23 varieties of vegetable seeds received from Europe, all, with the exception of lettuce, showed an excellent percentage of germination, notwith-

standing the fact that they were seeds of the preceding year. The failure of the lettuce is possibly attributable to the exposure of this seed to excessively high temperature during shipment.

The American peas, beans, and corns all responded quickly to germination tests, with the exception of the Lima beans, which proved to be defective.

The office germination tests were in every case confirmed by field trials at the Singalong experiment station. The two defective varieties were also given field tests, but were not distributed.

We have received a smaller number of complaints about defective seeds than in previous years. Reports have been received, however, that our tomato, pepper, and cabbage seeds were entirely worthless. In a number of cases we have been able to furnish young plants grown from the same lot of seeds to the persons making these reports.

Experiments conducted in Manila show that perfectly fresh seeds of many plants are affected by extremes of either drought or moisture. At altitudes of 4,000 to 5,000 feet these conditions, if accompanied by low soil temperatures, are still more unfavorable for germination. Tomato and eggplant seed planted at Baguio in January, 1904, failed to germinate and were pronounced defective. Early in May of the same year, when the seeds were four months older, and presumably not improved by age, they germinated freely. Undoubtedly the demand for vegetables at Baguio comes at a time which necessitates planting the seeds during the coolest season of the year, corresponding to midwinter in the United States. At this season heavy fogs and even frost are frequently seen, and ice has been reported in the mountains near Baguio. The soil temperature is evidently quite low, vegetable growth is very slow, and seed germination correspondingly uncertain.

The climatic conditions, intelligence of the farmers, and many other things that affect plant growth vary so widely in the islands, and even in the same province, that great care has to be exercised in sending out seeds if favorable results are to be expected.

EXPERIMENT STATIONS.

SINGALONG EXPERIMENT STATION.

SOIL.

The soil at Singalong is very sandy. This is due to the fact that the station grounds face on a large salt estero, or tidal creek, and are only about one-half kilometer from the shore of Manila Bay. Slightly below the surface the washed beach sand formation is clearly visible. The soil is very porous, and the water readily percolates down to the water table, which is, however, very near the surface during the rainy season. There is no place on this station that is over two meters above sea level.

WATER SUPPLY.

There is a 6-inch artesian well at Singalong in which the water comes within a meter of the surface. Just below the water level in the well it is connected across to an overflow cistern having a capacity of 15,000 gallons. A 6-inch duplex pump is so connected that it will take water from the well, from the cistern, or from both, as desired. A storage and pressure tank with a capacity of 6,000 gallons, elevated 8 meters, furnishes the means of securing water on all parts of the grounds, to which it is carried through a system of pipes beginning with 3-inch pipes and running down to 1. A small 8-horsepower steam engine is used for running this pump, and from about the middle of December until the middle of May it is operated every day to furnish water for irrigation purposes. On account of the limited water supply no flooding can be done, but the water is conducted through trenches which have been puddled to prevent rapid waste in the sandy soil.

CROPS.

Guinea grass.—A few roots of this grass received from Honolulu, 20 of which arrived in good condition, were propagated by division. It has proved very successful, and at the present time there is about half a hectare of plants growing at the Singalong station grounds. In addition, a sufficient surplus has been grown to make liberal experimental plantings on the stock farms at La Trinidad and Alabang, from both of which places come encouraging reports

of its vigorous growth. A small amount of the tops have been used as green forage, and were relished by the animals, being eaten up clean by both horses and cattle. Although two cuttings of forage have been made from the original plants, and a third is well advanced toward maturity, they give no indications of exhaustion. The necessity for frequent subdivision for propagation has prevented the taking of any yield records. It can only be said, therefore, that appearances indicate a large forage yield per acre.

Paspalum dilatatum.—This water grass, seeds of which were procured from Australia, has made a very satisfactory growth. It is reputed to endure more drought than the species of *Paspalum* found in the Philippines, and we shall propagate it extensively during the coming year.

Corn.—On account of the small size of the station grounds, it has been found impracticable to grow more than one variety of corn at a time. The principal variety produced this year was Moseby, the seed of which was obtained from Mississippi, in which State it was originated. This corn has retained its characteristics in succeeding generations better than any other variety we have so far grown. It is a white corn with very deep grains and small cob. These characteristics are just the opposite of most native corns, and the Moseby would no doubt be excellent to cross with them. Several small lots of seed were selected, cured, tested, and distributed in the islands. No yield tests were taken, as most of the corn grown was sold to be used as roasting ears. Small plantings of sweet corn were made, but were very much dwarfed and became mixed with the Moseby corn. Corn grows best here in the dry season with artificial irrigation. The growing of green corn for the Manila market might be made a thriving and profitable industry. There is a large demand for this product, and there are many locations along the Pasig River where an unlimited supply of fresh water is available. In some of these locations pumping machinery is already installed for the irrigation of zacate.

Broom corn.—Renewed experiments were made with this sorghum during the year and some very fine samples of "brush" obtained. Our demonstrations have advanced far enough to indicate that broom corn may be grown as a succession crop almost throughout the year. Brush which was taken during the rainy season does not appear to discolor or stain, and this will permit of production for broom making over a long period.

Sorghums.—The original types of sweet sorghum, as well as the nonsaccharine Kafir corn, Milo maize, and Egyptian corns introduced by the bureau, have all been grown at the Singalong experiment station grounds, but owing to the limited area available and the necessity for close planting, these various sorghums have interbred freely. We now have a large number of natural hybrids, which, in addition to the races mentioned above, have a strain of broom corn, as well as a sprinkling of *Sorghum negrosensis*, a native species which has been grown to determine its forage value. Some of these hybrids are remarkably robust, and more productive of forage than any of the pure races. In yield and quality of seed they seem defective, and it will be necessary to reimport pure seed and cultivate the different varieties on separate farms, in order to continue the production of pure seed for distribution.

Velvet beans.—We have continued planting the Florida velvet bean (*Mucuna utilis*) at all seasons, and while it never fails, it is a slow grower, requiring about five months to reach maturity. The beans are borne in small clusters at the base of the vines, where they never completely dry and are difficult to harvest. They have not proved very prolific and the cost of producing seed is considerable. The best result obtained with this crop during the past year was when planted in the same rows with sorghum and Kafir corn. The bean vines run up the sorghum and both are then cut for green forage. This pruning seems to strengthen the beans in the further production of runners.

This bureau has brought into cultivation a native velvet bean, *Mucuna lyoni*. This was a wild and, until recently, undescribed species found in the Pampanga Valley. It is quite distinct from the Florida velvet bean, and is readily recognized by its larger and much lighter-colored leaves, large woody main stems, and abundant succulent branches. The flowers, instead of being dark colored and growing in closely compacted bunches, are pure white, or greenish white, and hang in long, open racemes. From the three original seeds obtained, which weighed two grams, 7.04 kilos of seed were grown. The three plants were trained upon trellises, and were stimulated in every way to the maximum of production. From a subsequent field test alongside of the Florida velvet bean, and grown under like conditions, the product of the Philippine velvet beans was the greater. It has now been grown to the third generation, is losing the wood-

iness of the main stem, and continues to be very prolific. *Mucuna utilis* is edible, but so unpalatable as to be classed only with stock foods. *Mucuna lyoni*, although it cooks rather dry, is quite palatable and a great improvement on the former. Tests made at the bureau of science proved this bean to be without any trace of hydrocyanic acid, a poison which often occurs in tropical beans in deleterious quantities. Samples of the seed have been furnished the Bureau of Plant Industry of the United States Department of Agriculture in sufficient quantity for field tests in the Southern States and such other investigations as they may desire to make. In general vigor and productiveness of forage, as well as seed, it far surpasses *Mucuna utilis*. Inasmuch as soil-renovating crops also serve to repress cogon and other gross weeds, and furnish both animal and human food, these crops must play a highly important part in Philippine agriculture. This fact makes the discovery of *Mucuna lyoni* an economic benefit of signal value.

Sesamum or *Liñga*.—Further work was done with this oil-seed crop to determine the season when its planting would be attended with least risk from loss. In rich soils it makes so rank a growth that it is apt to lodge during heavy rains when approaching maturity. On the other hand, a liberal supply of water is necessary for the production of a good crop. The first trial made at the opening of the dry season resulted in a dwarfed growth and a very inferior crop. From a planting made in June, 1906, we harvested a grain product at the rate of 473 kilos per hectare. Some grain was lost by lodgment from the heavy rains of September, but the amount was small and certainly less than one-fifth of the total. From this it seems better to take the risk of loss from rain rather than to invite the more complete failure resulting from drought. The Philippine Products Company has declared sesamum to be the most tractable oil seed which comes to their hands, and it is our aim, by further experiments and distribution of seed, to promote this industry as a promising source of revenue to the small native farmer.

Carolina golden rice.—As the result of favorable preliminary work, further experiment and a wider scope of introduction were carried on with this grain. A plot of it sown in drills 18 inches apart on July 13, was cultivated very much as corn, had no artificial irrigation, headed up in ninety days, was harvested in one hundred and twenty days, and yielded on thin, sandy land at the rate of 52 cavans to the hectare. In the rice experiments, one of the aims of the bureau has been to reduce to something like uniformity the great number of varieties of rice grown in these islands. In Carolina golden we have found a variety which is of good size and form, very early, prolific, of excellent milling properties, and uniform in ripening. It is a lowland rice, but can not be transplanted to advantage. The native farmer being accustomed to transplanting all lowland rice, the distribution of Carolina golden must be made with caution and preceded by educational work pointing out the radical changes in method of planting required. As rice is the most important of our cereal crops, and as Carolina golden appears so nearly to meet the standard of requirements, it is desirable that we make long continued experiments both with this and other varieties.

Tanias.—The single bulb of this promising variety of "taro" or "gabe" obtained from Porto Rico three years ago, has proved very prolific and has furnished sufficient "sets" to permit of planting more than 150 linear meters of rows. From this it appears that a considerable public distribution can be made next season. Our previous experience, that this species of *Xanthosoma* will produce a good crop with less water than the *Colocastas* grown here under the name of "gabe," is confirmed, and the indications are that this plant will be a useful addition to our list of staple food crops not dependent upon irrigation.

Venezuela black bean.—This is a species of *Vigna* received under the above name from Herbertshoe, New Guinea. It appears to be one of the cowpeas, and closely resembles the "clay pea" of Louisiana. After three months it is yet unproductive but has made phenomenal growth of vines.

Avocado pear.—The largest tree at the Singalong experiment station flowered quite freely during the past season but failed to set any fruits. Anticipating this as a possibility, a considerable number of flowers were carefully pollinated by hand. As this method also failed, the indications are that the plant is possibly self sterile. During the year other plants have attained to flowering size and the result of cross-pollination is awaited with much interest. A few avocado pear trees planted at Lamao made such superior growth that we have recently set out an orchard of half a hectare at that station.

Vanilla.—Some vanilla plants brought here a few years ago were lost in the typhoon of September, 1905, and in view of the depressed condition of the vanilla industry no efforts were made to reintroduce the plant. A few were received as exchanges about a year ago, and were planted out at the Singalong experiment station. They have grown exceptionally well. Some of the plants have made leaders 3 meters long and are quite robust. This rate of growth is unusual, even in Vera Cruz, where the plant is supposed to attain the highest degree of perfection. It probably indicates that the conditions about Manila are very favorable for vanilla growing and that the distribution of these plants is to be recommended.

Monstera deliciosa.—Three cuttings of this unique and excellent fruit-bearing vine were received from Brazil nearly one and one-half years ago. One died and the other two remained dormant for eight months, but then started to grow. They are now well rooted, are making a strong growth, and there is reason for believing that the introduction will prove successful.

Pineapples.—A few of the Natal pineapples brought here from Durban have fruited. In tenderness and in freedom from fiber and core they are a marked improvement over the Bulacan variety which has been grown at Lamao. We have lately secured 200 plants of the variety grown in Marinduque and have planted them out along with the West Indian varieties now growing at Singalong. This makes five kinds we now have growing at this station—Smooth Cayenne, Ripley, Red Spanish, Natal Canning, and Marinduque. The trials proposed include fertilizer and irrigation tests, determination of the relative yields and quality of fruit of the different varieties, and the production of plants for distribution.

Coffee.—The small planting of maragotype hybrid coffee made in Lipa, Batangas Province, four years ago produced last year a first crop of a little more than 1 pound of berries to the tree. Although not immune to the leaf blight, it is so strongly resistant to the disease and has survived so well in that pest-afflicted region that the berries were all quickly bespoken by old coffee planters of the district, quite a number of whom have planted seed beds for the purpose of renewing their plantations. As this seed was quite unfit for planting, it is difficult to avoid the conclusion that some future disappointment is in store for these planters whose enthusiasm has outstripped their knowledge or wisdom. The few trees at the Singalong experiment station are of the same age, and are equally as good as the plants at Lipa, notwithstanding the unfavorable environment.

Cassava.—Small plantings of the native white cassava were made with a view to testing its growing period, yield, and composition. This variety seems to reach maturity in about ten months. No satisfactory yield tests could be made on account of the constant depredations of hogs running at large in the city at night. A number of samples analyzed contained about 28 per cent of starch, which is 2 per cent more than is credited to this root in Florida, where it is grown extensively for the manufacture of starch. Cassava is now receiving some attention from prospective manufacturers of starch and tapioca in this country. The following food analysis of cassava shows it to be a valuable root crop food, especially for hogs and cattle.

CASSAVA ANALYSIS.

	Per cent.
Protein	1.5
Carbohydrates	25.2
Fat .....	.2
Fiber	2.3

Native squash.—Renewed plantings were made this year with a native Melopepo secured the previous year in La Laguna Province. The quality of this fruit is unexcelled by any known native or exotic cucurbit, but the latest trials confirm its scanty bearing habit, and the defect is one we have been unable to overcome through cultivation. On this account further work will be discontinued. The brilliantly variegated greenish yellow leaves of this plant are so unique as to suggest its cultivation as an ornamental plant.

Tongo.—This is the native name of a most excellent yam brought in February of the present year from Mindoro. The tuber is not so nearly spherical as that of the variety found in Luzon and is slightly less glutenous than our common yam. It has much greater mealliness when cooked than *name*, *tugut*, or any of the yams in common use here. In view of the very great confusion

existing in Dioscorea, and pending Doctor Prain's revision of the genus, it would be premature to say that this is a new species.

As it was obtained under forest conditions it has been a little slow in adapting itself to cultivation in Manila, but since the advent of the rains has taken a new and more promising start.

Condol (Benincasa cerifera).—This was grown as a trellis plant and from a single vine 62 fruits were obtained. Chinese buyers are always on the alert to procure this fruit. The average yield of a single plant of Benincasa is about 6 fruits, and the extraordinary yield cited above was due to the exercise of a slightly modified system of pruning practiced, though rarely, by Filipino gardeners. It consists merely in splitting the main stem and leading branches and inserting wedges, which has the effect of checking leaf growth and developing flowers. In addition to this "pinching back" was practiced with the result mentioned above.

Parameria vine.—Cuttings of this rubber plant, brought from Mindoro in February of the present year, successfully rooted and are now growing nicely. The seeds of Parameria are small and developed by that method of propagation tedious, hence the experiment of determining if, by the use of cuttings, rapid multiplication could be secured. The botanist of the bureau of science was unable to determine the age of the samples of vine brought in, but the indications point to its very early development, probably in one or two years from cuttings if planted under suitable forest conditions.

Laboratory analyses show the dry bark of this vine to contain 4.52 per cent of pure caoutchouc. It is, however, associated with oils and resins, which when extracted leave the rubber tacky and of low value unless vulcanized. The vine is too small to be successfully tapped, but the uncontaminated rubber can probably be obtained by a centrifugal or other mechanical process. As 1.48 per cent of the live weight of the plant is rubber, and as small parcels of the wild vine produced at the rate of 4 tons per acre, there is a theoretical yield of 120 pounds of rubber to the acre.

The questions to be determined in regard to Parameria are: First, a suitable extraction process; and second, the time required to secure a crop.

Maquey.—The small plats of native and Hawaiian maquey growing at the Singalong experiment station have continued to flourish, notwithstanding the fact that they are on low, level land, almost at sea level, and where no special provision is made for drainage. During the year all of the Hawaiian maquey was removed to the border of the land, where drainage was possibly a little better than in the center of the plat where it was formerly planted. Part of it was set under the shade of clumps of bamboo and part in the open. Where it had strong sunlight and was not crowded, it has made a very satisfactory growth, the leaves being about a meter long, though it is not yet three years old. The leaves are far superior in shape and development to the native maquey, which has a thin leaf tapering from base to point with such rapidity that the leaves do not attain the desired weight. Both kinds have produced an abundance of strong healthy suckers, which have been distributed.

SILK CULTURE.

Near the close of the fiscal year this bureau, in connection with the bureau of science, started a series of experiments in silk culture.

The results thus far obtained are not sufficiently complete to justify a statement as to the probable success of this industry in the Philippine Islands.

LAMAO EXPERIMENT STATION.

SOIL.

That part of the Lamao forest reserve under the control of the bureau of agriculture is located principally near the shore of Manila Bay and on the Lamao River. A considerable portion of the land now in cultivation is hilly and broken.

The soil is for the most part underlaid with drift boulders, cobblestones, and gravel, and varies from red clay to beach sand, including all varieties of sandy loam. In many places it is so porous that there is difficulty in conducting irrigation water across it without puddling the ditches or fluming. The unused land is overgrown with a dense growth of brush, which necessitates considerable work in clearing and makes cultivation difficult until the roots and stumps have all been gotten out.

WATER SUPPLY.

The Lamao River has several branches originating in the mountains just back of the station, and they furnish an abundant supply of water to irrigate all of the land now in cultivation. Irrigation water is secured with perfect ease, requiring only a temporary dam of boulders taken from the stream and a small ditch leading down to the fields.

BUILDINGS.

All buildings at this station are of a temporary nature except a small office near the bay shore. Toward the close of the year a large nipa house for the superintendent was begun at Station One near the beach. As there is no other place in this vicinity where botanists, foresters, and other scientific investigators can find suitable quarters, sufficient room is being provided to accommodate them in the superintendent's house.

White ants are numerous at Lamao, and buildings, bridges, and other permanent structures require constant repairs to keep them in order.

CLEARING AND FENCING.

During the year about 4 hectares of land have been cleared, fenced, and brought into cultivation. All new land put under cultivation requires thorough fencing on account of wild hogs, which are very numerous and constantly destroy nearly all kinds of cultivated crops.

NURSERY.

There was considerable decrease in nursery work on account of the fact that the demand for economic and ornamental plants was not as great as had been anticipated. The facilities at this station for the propagation of forest trees, ornamental plants, and flowers are almost unlimited. It is believed that the growing of such plants might be greatly encouraged by the production of a liberal supply at Lamao for free distribution to municipalities and schools throughout the islands.

CROPS.

Coffee.—Among the more interesting things growing at this station during the year might be mentioned a plat of coffee. A part of this has been irrigated and has made an excellent growth, while the unirrigated portion has done only fairly well.

Rubber.—A planting of 400 Brazilian rubber trees was made in the brush land with a view to determining whether or not they are capable of making satisfactory growth without clearing the land. These trees have done very poorly, and will probably have to be removed to prevent their entire destruction. A few trees of the Mexican rubber planted at this station under more favorable conditions have done quite well.

Avocado pear.—Avocado pears have done especially well, and a plat containing almost one-half a hectare has been planted out.

Maguay.—In addition to the 20,000 maguay plants previously put out at this station, 5,000 Hawaiian sisal suckers have been planted during the year. All of the maguay is making a very satisfactory growth, and in the course of two years more there will be an abundant supply of suckers for distribution. This crop has proved a very easy one to handle on these broken hill lands, where nothing more was done than to cut down and burn the brush, set the plants out at the proper distances, and afterwards keep the weeds and sprouts cut down to avoid shading the plants.

Abaca.—Mention has already been made of 700 abaca plants produced from seed and set out at this station. Abaca of other varieties will be added and grown under the same conditions, so as to test their comparative merits.

Kapok.—An experimental planting of young kapok trees was made at Lamao in thin but uncleared forest. The trial was made to determine if this plant would hold its own in competition with the native woodland or jungle growth. The trees have survived the first dry season, which, under such conditions, was perhaps all that was to be expected. Seed plantings were also made to determine the relative loss or gain in time over planting truncheons or cuttings of the stem or branches. This seed sowing was made in mid September, 1905, and at the close of the present fiscal year, when only 20 months old, a number

of the plants are over 6 meters in height and have a girth measurement of 40 centimeters at a height of 30 centimeters from the ground. Some of the trees planted at Lamao produced pods in less than two years from the time of planting. This information is of considerable importance, as there are localities where kapok does not occur, and in any case the procuring of large cuttings and their transportation to distant points would deter many from planting. This experiment has definitely established the fact that planting upon a large scale may be cheaply and expeditiously effected by sowing seed.

Pineapples.—The Bataan pineapples growing at Lamao have been irrigated during this year and have produced a fair crop of fruit, 700 having been shipped to Manila. This native pineapple is a vigorous grower, and while defective in size and flavor, promises well for canning purposes.

Bananas.—Several varieties of native bananas, as well as the Hawaiian dwarf, are growing at this station. Enough plants have now been produced to put out regular plats, and during the year experiments as to yields, quality, irrigation, etc., will be made.

Miscellaneous.—An experimental collection of various other tropical and sub-tropical trees and plants was put out at this station. Many of these have done so well that further plantings will be made during the coming year.

Among the plants of special interest and economic importance which we have introduced and succeeded in getting well established are the red Trinidad guava, American Genip, Australian chestnuts, and Pleognum. The lemons, grape fruit, and grapes originally planted at the third station on top of the mountain were threatened with destruction and were brought down to the first station. They are all doing much better and promise to be quite successful. The three varieties of lemons growing are the Lisbon, Eureka, and Sicily. After repeated trials we have failed to establish at either Manila or Lamao the Durian or Mangosteen fruits from the southern islands.

Small numbers of the following trees were received and planted with the following results: Calabash tree, good; Anona cherimola, dead; Castanospermum australe, good; Guava araca, good; Macadamia ternifolia, dead; Casuarina equisetifolia, very good; Durio zibethinus, fair; Pleogyne solandra, very good; Enocarpus edulis, fair; Burbank plum, badly attacked by some leaf-eating insect, plants old; Kiefer pear, promising; many varieties of European and American grapes, but mostly varieties grown in Middle States, not making a very encouraging growth.

BAGUIO EXPERIMENT STATION.

LOCATION.

This station is located about 5 kilometers north of the town of Baguio in the Trinidad Valley, which is a crater-like depression drained by the Balili River, which passes through this valley, bounds the farm on the east side, and makes its exit through a notch on the north side of the valley. The altitude of this section is approximately 1,500 meters.

SOIL.

The soil is made up of decomposed shales and sedimentary lime rock found abundantly around the mountain sides and in the valley. It is liberally intermixed with silt containing some sand. The soil of the entire farm was evidently formed by the action of the river. It is not at all fertile, and will require a judicious application of manures and chemical fertilizers and the growing of leguminous crops in order to bring it up to a satisfactory state of productiveness.

CLIMATE.

This province has a temperature reaching the frost line in midwinter and a rainy season a little earlier than that of the west coast of the islands—that is, beginning in May and ending in October. On account of these facts this section of the Philippines promises to be a favorite resort for those seeking health and pleasure. Ever since the summer capital of the islands was established at Baguio there has been considerable demand for fruits and vegetables during the dry season, especially during the months of March, April, and May. The climate at this season is delightful to the tourist, but in order to produce vegetables to be available at this time of the year they have to be planted early, when the daily minimum temperature goes down almost to the frost line. This

has proved to be a condition making it possible to grow all of the early spring vegetables of the United States in this section, but those things which flourish best during the summer weather, such as corn, can not be successfully produced at Bagulo during these months.

WATER SUPPLY.

The water supply for the station was secured by constructing a temporary dam of boulders in the Balili River and conducting the water in an open ditch which follows the road through the valley.

OPERATIONS.

This station up to the beginning of the past year was operated in a small way with a view to obtaining experimental information with reference to the crops suited to this section of the islands and incidentally for the production of vegetables for sale to those frequenting this resort during the dry season.

The plant breeder of the bureau was sent to Bagulo in February, 1906, and was placed in charge as superintendent at the beginning of this fiscal year. The operations of the station have since been greatly increased. The irrigation system has been extended, sod lands put under cultivation, roads built, and drainage ditches put in. An extensive system of variety tests, germination experiments, plant-breeding work, fertilization, cultivation, and rotation has been established. Practically every crop in the Philippines is now being tested at Bagulo, and other economic plants are being brought from different parts of the world for trial.

PLANT BREEDING.

The present superintendent has not been at Bagulo a sufficient time to obtain definite results in his plant-breeding work. The hybrids thus far produced have not reached the desired characteristics, being mostly in the second generation.

Considerable attention has been given to the improvement of the wild *Rubus* and wild strawberries, as these plants are already growing in great abundance in the vicinity. If they can be improved in productiveness, size, flavor, and resistance to disease by hybridizing, cultivation, or otherwise, they will prove a valuable addition to that section. New types of *Rubus* and *Fragaria* are being evolved, and considerable improvement has already been produced in the species of wild raspberry which has been brought into cultivation.

California lemons and oranges have been grafted on to the native citron and promise excellent results. This work is of special value in view of the fact that the native citron is already acclimated to that section and is able to withstand the heavy rains of the summer months. This citron can also be propagated by cuttings and shows resistance to fungous diseases.

Wild blueberries placed in cultivation have improved greatly in size and flavor and the bearing period has been very much prolonged.

A tomato which is thought to be resistant to damage by excessive rainfall has been produced by crossing the native tomato with an improved variety.

By a system of root grafting and training, young mulberry trees have been made to produce fruit within a few months, and the berries appear to be much improved in quality.

There are many other lines of plant breeding in progress which will be reported on more extensively during the coming year. Free use is being made of selection, crossing, hybridization, budding, grafting, and cultivation in the improvement of plants.

CROPS.

Potatoes.—Potatoes have been the subject of considerable experimenting, as this is one of the staple crops grown by the Igorots. Four varieties have been tested during the wet and dry seasons, and while the yield has been rather small the quality was excellent. The low yield was no doubt due in a large measure to the poverty of the soil, which can be overcome by proper fertilization. This is one of the most promising crops for the Province of Benguet.

Vegetables.—Nearly all of the standard varieties of vegetables, including peas, beans, tomatoes, spinach, cabbage, turnips, carrots, lettuce, kohlrabi, peppers, radishes, eggplant, beets, cucumbers, native onions, squashes, garlic, and mustard have been successfully grown at this station during the past year. The following vegetables have been grown in a small way and most of them are worthy of further consideration: Rhubarb—Half dozen plants, growing nicely.

Celery—Grows slowly, is fibrous, does not blanch satisfactorily. Broccoli and Cauliflower—Varieties grown not satisfactory, better varieties will probably succeed. Artichokes—Very young, but doing well. The seeds of muskmelon and watermelon failed to germinate.

Small fruits and berries.—Strawberries—Only a few varieties thrive and set fruit. The American varieties without runners have given best results. One of these varieties is an everbearing, large fruited, somewhat crested variety of excellent flavor, with firm dark red fruit; the other is a smaller variety with bright red, oblong berries. The names of these two varieties are not known. The French variety, "Reine de prairie," the principal one now in cultivation at Baguio, is a small everbearing variety with an erect stem. It has given only a light yield, but can probably be improved in this respect by proper fertilization. Raspberries—A few plants of American and Australian varieties are growing nicely, but have not yet reached the fruiting age. The native red, yellow, and black raspberries are now being cultivated with a view to their improvement and are fruiting freely; three plants were recently received from the United States and are to be used in cross breeding with the native varieties.

Fruits.—Citrus fruits—About 2,000 seedlings and cuttings of the native citron are growing nicely and are to be used in budding and grafting work with improved varieties of oranges and lemons. Deciduous fruits—The apple, pear, plum, quince, apricot, and peach trees bloomed and set fruit which dropped very early. One Australian chestnut is reported as in bloom and one English walnut tree is alive and gives some promise of growing. Grapes—A number of imported and native varieties are growing fairly well, but are too young to determine results; two of the Concord vines flowered, but failed to set fruit. Japanese persimmons thrive very well. Loquots are promising. Coffee—The nursery contains a large number of seedlings. Coffee grown from cuttings promises to give fruit much earlier than that from seedlings. Figs—Cuttings are growing nicely.

Field crops and forage plants.—Corn—White dent variety produced very small yield in rainy season, the only time of year when this crop succeeds at all. Sorghum—Grows very slowly, but produces a fair crop of forage in six or eight months. Millet—Fairly satisfactory. Oats—The best green forage crop yet grown; sown in October they yield a fair cutting by March, but do not produce grain. Sorghum and oats have so far furnished the bulk of the green forage produced at this farm. Rye—Makes light growth, but produces small amount of grain. Barley—Generally unsatisfactory; chevalier variety grows best, but produces no grain. Wheat—Practically all varieties failed except red Fife and Triticum durum, which produced some grain. Flax—Very promising; grows well during both rainy and dry seasons; seeds freely and fiber seems of excellent quality. Castor bean—Thrives well and fruits at all seasons. Sunflower—Fairly successful. Alfalfa—has given two cuttings in five months; in flourishing condition; promises well; the plats have not been inoculated, but show a small number of root nodules. Vetches—Smooth vetch has made fair growth; seeds abundantly and promises excellent results; hairy vetch shows a more fibrous growth, but does not produce seeds. Clovers—Volunteer plants of red, white, Trifolium repens, and Medicago lupulina have made vigorous growth and seem worthy of further planting. Sanfoin—Slow grower; not promising. Bermuda grass—May be regarded as native as it grows freely throughout the Trinidad Valley and flourishes better during the dry season than any grass there. This will probably be the standard pasture grass of the higher altitudes, like Baguio, as well as for most of the lowlands in the Philippines.

OBSTACLES.

In addition to the poor soil, cold seasons, and heavy rains the plants grown at this station have had to withstand the ravages of a large number of insects. These insects attack practically all of the vegetables, fruits, berries, and even field crops. Fungous diseases have also caused much damage to potatoes, tomatoes, peas, and a few other crops, but have generally been susceptible to control by spraying with Bordeaux mixture. Much of the land was in sod, and it has required a great deal of labor to bring it in cultivation and provide the necessary irrigation and drainage. The conditions at this station are probably more favorable for growing many crops and vegetables introduced from the United States than any other farm operated by this bureau. It is located in the heart of a section occupied by one of the primitive tribes of the islands, and

every success there means much more than it would in the more enlightened sections. On account of the remoteness of its location the operation of this farm is necessarily expensive, but a reasonable expenditure seems justifiable in view of the possibilities existing. Bagulo is one of the stations from which we expect great things in the future.

BUILDINGS NEEDED.

It will be necessary during the coming year to erect permanent buildings at the Bagulo station, as the temporary grass structures used heretofore are now practically useless on account of decay. It seems especially desirable to construct a greenhouse, in which seeds can be propagated during the cold season for transplanting in early spring.

LA CARLOTA SUGAR FARM.

LOCATION.

This farm is located in the foothills of the volcano Canlaoan, about 6 kilometers east of the town of La Carlota, Occidental Negros. It is in the best sugar-growing province of the Philippine Islands, where it was established by the Spanish Government as an experiment station for the study of the sugar industry.

SOIL.

The land at the La Carlota farm is undulating on the lower levels and rather hilly farther up the mountain sides. Much of it is underlaid with drift boulders, cobblestones, and gravel, with a superposed stratum of soil of black volcanic matter resembling in many respects the lands of the Middle Western States. Along the streams the soil is all washed off of the rocks, so that in many places near the streams cultivation is out of the question. The soil of this farm is considered excellent for sugar growing, and the results obtained may be taken as a fair sample of what can be accomplished on the best sugar lands of the islands.

WATER SUPPLY.

A river of considerable size bounds the farm on one side, and there are several smaller streams within the limits of the farm. A dam has been constructed in the larger river and a canal built which carries the water a considerable distance from the stream where it enters a tunnel through which it passes down to the sugar mill where it is used to produce the power required for milling the cane produced on the farm. A branch of this canal carries the water out farther onto the farm, where it becomes available for irrigation purposes. Much trouble has been experienced in attempting to use the water of this river for irrigation purposes, as the hacenderos having mills farther down complain that there is a lack of water for power when it is used for irrigation purposes higher up the stream.

EQUIPMENT.

The sugar manufacturing equipment on this farm is of the antiquated type in use in the West Indies about forty years ago. It consists of a 3-roller mill operated by water power and a train of open kettles, through which the juice passes as it is being made into sugar. This equipment was found on the farm when it was turned over to the bureau of agriculture. It has been operated there because of lack of means to purchase any other, and for the reason that the condition of the sugar industry in the Philippines is not such as to encourage a large expenditure in equipping a sugar experiment station.

OPERATIONS.

Up to the present time the farm has been operated only in a small way, less than 100 hectares of cane having been under cultivation. However, this is more than can be handled expeditiously with the milling outfit now provided, as was

shown during the past season, when it required from early in December until April 21 to mill the small quantity of cane grown. An effort has been made to run the farm on an economic basis, according to the methods generally practiced by cane growers in these islands rather than to undertake any elaborate system of experiments which would have cost more money and given less returns. In fact the great bulk of the crop consists of native varieties of cane, although we have grown small plats of imported varieties. The farm has not been so laid out that the different plats would be comparable, nor has much of the required equipment for experimental work—such as wagon scales and technical apparatus, required in the sugar house—been provided. An attempt has been made to estimate the crop of cane as accurately as possible and to determine the yield of sugar by actual weights. The best yield yet obtained was from a field of first rattoons, Louisiana striped cane, which produced at the rate of 118½ piculs of sugar per hectare, or 3.3 tons per acre. Most of the imported varieties obtained do not seem peculiarly adapted to the conditions of these islands. Many of these varieties are canes requiring a long period of growth for their full development. As all canes in the Philippine Islands generally mature off early in the dry season—beginning from November to January—they make the entire growth in from eight to twelve months, averaging not over ten. In other countries many varieties of cane frequently grow from fourteen to eighteen months, and when brought here seem to persist in that habit. The result is that they must be planted very early or they will not mature in time to be milled along with the native cane. This necessitates planting them as early as October or November, in order that they may reach full growth. By the end of the dry season they have attained a height almost equal to the native cane at maturity, and while the stalk is of good size near the ground, it tapers off rapidly and becomes very small near the top. When the rains begin the new growth at the top of the stalk develops to normal size, but having such a small weak portion below to support it, falls down and becomes badly tangled. Once down, and in contact with the ground, it begins to sprout, which destroys to a large extent the sugar-making value of the cane. In some cases it is split or broken off, and stalks so injured begin fermenting and ultimately decay or become an easy prey to insects and ants. Finally, when the harvest comes, these improved varieties of cane frequently give very poor results as compared with the small native types. It is possible to overcome many of these difficulties by better systems of cultivation and abundant irrigation throughout the dry season, so as to keep the cane in a healthy growing state. Another notable feature in connection with the varieties of cane grown is, that while the native canes will yield a No. 2 Iloilo sugar and rarely run below No. 3, the improved varieties, and especially the plant cane, produce No. 4.

PROPOSED CHANGES.

The work being done with sugar at La Carlota farm is altogether unsatisfactory, and it would seem better to convert this farm into a general experiment station rather than to continue it as a sugar farm. If such a station were to be established the improved and native varieties of cane could be grown in sufficient quantities for milling tests and for general distribution of seed on the sugar farms of this and other provinces throughout the islands, many other crops that this bureau recommends for crop rotation in connection with sugar growing could be planted, and sufficient information gained to determine the adaptability of such crops to the soil and other conditions of Negros and similar sugar-growing provinces.

It would certainly seem desirable to continue work with maguay at La Carlota. About two hectares of Hawaiian sisal have already been planted and it is growing nicely. A liberal supply of abaca was planted on this farm three years ago, a part of which was set out under shade and part in the open. This experiment has been of value as shown by the fact that the abaca planted under shade is doing quite well, while that planted in the open is nearly all dead and the remainder very small. Excellent work could be done with rice, such as the growing and testing of varieties, yields, effect of fertilizers, and the operation of machinery—such as threshers, hullers, etc. It is not probable that tobacco could be successfully grown at La Carlota on account of the quality of land and nearness to the sea. This farm ought to be particularly suited to live-stock work, especially with cattle, hogs, and goats, great numbers of which could be maintained with but very little cost other than the fresh green foods produced

on the farm. It could also be used as a base for the operations of the forces of this bureau working in the suppression of animal diseases and at times might be available as an inoculation station.

DIVISION OF ANIMAL INDUSTRY.

This division includes the veterinary control work, the serum laboratory, the dairy farm at Alabang, the Trinidad stock farm at Bagulo, and all general investigations in animal industry. It was formed as a division of this bureau by act No. 1407, in which provision was made for the transfer of the veterinary force from the bureau of health to the bureau of agriculture.

CONTROL WORK.

RINDERPEST.

Most of the work performed during the year has been that of the control of rinderpest, which has been prevalent in a majority of the provinces and still prevails in many localities. The severest outbreak of the year was experienced in the province of Bantangas. The disease appeared in the municipality of Bauan the latter part of June, 1906. No report of it was made until July 31, on which date the provincial governor wired the executive secretary. A veterinary force was sent to Batangas, and after almost two months' hard work brought the disease fairly well under control. Remnants of the outbreak still exist, however, in the mountainous sections and in adjacent provinces, to which it spread despite all efforts to stop it. While no other alarming outbreaks have occurred at any one time, serious losses have been sustained in many of the provinces by the repeated appearance of this disease.

It seems highly probable that rinderpest has not prevailed to any greater extent than in former years, but with the district organization and crop-reporting service prompt reports are sent in before the outbreaks become general. This fact, together with the reduction in our veterinary force, previously mentioned in this report, has made it impossible to respond to all calls for help. Even the agricultural inspectors have devoted nearly all of their time to the control of rinderpest. The work has consisted largely in serum inoculation of the affected and exposed animals, segregation, the enforcement of such quarantine measures as could be secured through local officials, and a campaign of education of the people in the nature and rational handling of this disease.

A total of 16,495 carabao and cattle have received the serum inoculation, with 269 deaths, or 1.6+ per cent. The very best of results have been obtained in every instance when the serum method was employed, and it never produces the disease.

Simultaneous inoculation was given to 44 animals, with one death, or 2.1+ per cent.

The greatest economy has been exercised in the use of serum, as only 3,746 bottles have been available for use in the provinces this year. It has been the practice to quarantine infected districts where possible, but the quarantine measures have been in the hands of the local authorities, who have not in all cases fully realized the value of such measures. In the absence of any insular sanitary law or quarantine measure we have been unable to keep the previously infected districts free from the disease on account of the constant movement of live stock from infected to noninfected districts.

During the rush of inoculations made in Batangas Province from August to November, the demand for serum was so great that quite a number of infected bottles were sent out and used, with the result that an alarming number of abscess formations followed the inoculations. The matter was brought to the attention of the bureau of science, which, at that time, had full charge of the serum manufacture. On January 1, when the serum herd was transferred to this bureau, the bureau of science was experimenting with the centrifugation and filtration of the serum to insure its freedom from infection. Serum thus prepared was so improved in appearance and gave such excellent results that permanent arrangements have been perfected by which all serum has since been prepared in this way. So far as is known now, not a single ulcer has since resulted from filtered serum. It is also highly probable that its immunizing value has been greatly enhanced, as formerly it often underwent decomposition in the bottles so that it gave off a decided stench on opening them.

HOG CHOLERA.

Hog cholera has been reported from nearly every province, and this disease has practically ruined the swine industry in the Philippine Islands. It has not received a great deal of attention, owing to the fact that rinderpest has been considered the most important disease which affects our domestic animals and has claimed almost the entire attention of our small force.

GLANDERS.

A total of 2,816 horses in the provinces have been examined for glanders, 87 of which proved positive. This disease is apparently prevalent in every municipality of the Philippine Islands. Owing to the belief among the natives that glanders is a curable disease, very little headway has been made in controlling it. The animals found positive to glanders, in the majority of cases were only quarantined by the municipalities, and if the cases showed a tendency to terminate in a chronic form, they were released and sent back to their owners.

SURRA.

A total of 4,852 horses, cattle, and carabao were examined for surra, 79 of which proved positive. The same measures regarding the positive cases were taken as were adopted with glanders. This disease has not been as prevalent during the year as it was the year previous. The following table shows the number of different species of domestic animals examined for surra:

Animals.	Examined.	Negative.	Positive.
Horses.....	2,888	2,815	73
Cattle.....	586	585	1
Carabaos.....	1,378	1,373	5
Total.....	4,852	4,778	79

FOOT-AND-MOUTH DISEASE.

Foot-and-mouth disease has been prevalent in a few provinces, but in no instance has it been considered serious.

DISEASES OF FOWLS.

Diseases of domestic fowls have been reported from nearly every province, and thousands of chickens and turkeys have died monthly in each district where the disease has been reported. The principal diseases affecting the fowls are chicken cholera and a parasitic disease, which affects the skin around the head and results in total blindness and, in a large majority of the cases, death.

PORT AND CITY OF MANILA.

INSPECTION ON ARRIVAL.

During the year there have been 93,017 animals inspected on arrival in the port, of which 37,831 were from foreign and 55,876 from interisland ports. Out of the number arriving from foreign ports, 1,744 were quarantined, in accordance with the provisions of the veterinary section of the sanitary code (chapter 24, of ordinance No. 86) city of Manila, on account of the various shipments being infected with rinderpest. The cattle were allowed to land and were quarantined in the owner's corral. Permission was given to the owners to slaughter at the public abattoir such animals under quarantine as were not actually infected with the disease. This quarantine has been of invaluable service to the surrounding country, where it has been the custom of the dealers in Manila to ship the imported cattle immediately on their arrival, as it has prevented the wholesale distribution of the disease by the shipment of these infected herds.

The following table shows in detail the port inspection :

FROM FOREIGN PORTS.		FROM INTERISLAND PORTS.	
Cattle	35,649	Cattle	2,431
Horses	1,252	Horses	1,876
Carabaos	720	Carabaos	1,403
Sheep	27	Sheep	164
Goats	30	Goats	838
Hogs	142	Hogs	48,230
Other animals	11	Other animals	144
Total	37,831	Total	55,086
Grand total		Grand total	93,017

Fees.—The sum of ₱15,434.60 was collected as inspection fees and deposited with the insular treasurer.

ANIMALS INSPECTED FOR SHIPMENT TO THE PROVINCES.

Cattle	2,090
Horses	70
Carabaos	397
Hogs	149
Goats	10
Other animals	4
Total	2,720

ABATTOIR INSPECTIONS.

A total of 80,179 cattle, hogs, goats, and sheep were inspected at the public abattoir or matadero in the city of Manila for the purpose of slaughter, of which 76,358 were actually slaughtered and received post-mortem inspection. Of the total number slaughtered 310 animals were condemned and cremated. The following tables show in detail the antemortem and post-mortem inspections and condemnations:

ANTE-MORTEM INSPECTION.

	Number.	Condemned.	Passed.
Cattle	24,301	11	24,290
Hogs	55,660	10	55,650
Goats	202	0	202
Sheep	16	0	16
Total	80,179	21	80,158

POST-MORTEM INSPECTION.

Cattle	20,783	10	20,773
Hogs	55,860	300	55,560
Goats	199	0	199
Sheep	16	0	16
Total	76,358	310	76,048

PARTS OF CARCASSES CONDEMNED, MISCELLANEOUS.

Cattle	7,384
Hogs	12,796
Total	20,180

The carcasses of the cattle were condemned for various causes—such as rinderpest, tuberculosis, and general bruised conditions. The majority of the hogs condemned were suffering from *Cysticercus cellulosæ*, though a few cases of hog cholera and swine plague were found. Parts were condemned for various local inflammatory processes.

Of late *Cysticercus cellulosæ* have been found at the abattoir to such an extent that it has threatened the pork industry of Manila.

According to the pork dealers who slaughter their hogs at the public abattoir, the great majority of the cyst-infested hogs come from the province of Batangas, and some of the smaller dealers who buy from that province almost

exclusively have been all but forced out of the business in the past thirty days owing to the large number of hogs condemned because of this disease. This matter was referred to the bureau of health for the purpose of finding out the cause of so much infestation and adopting measures that would lessen the prevalence of this malady. As there are no modern sanitary sewage systems in the municipalities in the provinces, swine are looked upon as the natural scavengers, and are allowed free access to human excreta, from which source they become infected. The prohibition of this custom might be practical at least in communities where the parasite is prevalent.

Twenty-one horses have been examined for soundness for the different bureaus and provincial governments, and four horses have been examined with a view to condemnation and slaughter. Twelve horses in the city have been inspected and condemned for glanders, one for surra, one with broken leg, one for lymphangitis, and one for extreme emaciation.

Twenty-one hogs were found dead in the hog market on Calle Azcarraga and seven have been found dead on ships arriving from other ports.

The veterinarians of the bureau stationed in Manila have been called upon by several other bureaus to treat animals suffering from simple diseases. All requests for work of this sort have been complied with without charge.

SERUM HERD, MANILA.

TRANSFER FROM BUREAU OF SCIENCE.

The herd of cattle, equipment, and premises used by the bureau of science in the manufacture of antirinderpest serum were transferred to the bureau of agriculture on January 1, 1907. It was also provided in the transfer that this bureau should furnish the bureau of science all calves and large animals required in the manufacture of vaccine for the bureau of health, for testing antirinderpest serum, and for other scientific purposes. Under this arrangement the bureau of agriculture became responsible for the management of the serum herd and all processes required in the manufacture of the antirinderpest serum up to the time it is poured off from the blood clot. It is then delivered to the bureau of science for final preparation and cold storage until required in the provinces.

CONDITION OF HERD WHEN TRANSFERRED.

At the time of the transfer the herd contained only 62 serum bullocks with about half of them producing serum. Most of the others required nearly two months to bring them up to the desired condition for bleeding. This made the amount of serum produced in January and February very small. During the six months 97 serum bullocks were purchased, and of these 7 died, the principal cause of death being the development of rinderpest about the time of purchase. Some bullocks have proved to be immune on arrival and given excellent results, but the ideal serum bullock is one that is neither immune nor infected when brought into the serum herd. Three very large Australian bullocks were in the herd at the time of transfer, and while they were carried through to completion they never gave good results. They were wild, very hard to handle, and for some unknown reason their blood always gave poor separation. Chinese bullocks cost less, are easier to immunize, are gentle to handle, and give more serum in proportion to cost than did these Australian bullocks. An effort was also made to use bullocks from the Batanes Islands, where rinderpest has never prevailed. The cattle there show a marked strain of the Spanish "fighting-bull" type, are large and handsome, but very wild. Five were purchased, but on attempting to inoculate them developed a virulent form of rinderpest, and it appeared that all of them were going to die. One was used as a virulent blood animal, two died from rinderpest, and the remaining two were left in such a weakened condition as to be almost useless for the production of serum.

The general condition of the herd has been excellent, probably due in part to the fact that a small amount of green forage has been fed constantly. It is a matter of regret that the herd could not be moved to the new farm at Alabang before the close of the year, where it is certain that great economy in maintenance will result.

PRODUCTION OF SERUM.

The total amount of serum produced during the six months ended June 30, 1907, was 534,500 cubic centimeters. The average number of cattle on hand

each day during this period was 94. The total number of cattle purchased was 174, the average purchase cost of each animal being ₱77.22.

The total cost of forage for the six months was ₱8,960.14, or an average of ₱0.529 per animal per day. The daily ration was 6 pounds of crushed food and 8 pounds of hay. In addition to this ration a small amount of green forage, probably not averaging more than 2 or 3 pounds per day for each animal, has been supplied from the Singalong experiment station. This would have the effect of reducing the cost of each ration $3\frac{1}{2}$ to 4 centavos.

The amount paid for salaries and wages during this period was ₱5,744.76, making the total cost of serum production ₱14,704.90, and the approximate cost of serum 2.75 centavos per cubic centimeter.

INOCULATION OF CALVES.

It is a common belief of cattle dealers that calves suffer much worse from rinderpest than mature cattle. That this belief is well founded is one of the interesting facts developed during the year.

The director of this bureau undertook a series of experiments during the fiscal year ended June 30, 1906, to prove the reverse—that is, to show that rinderpest is similar to Texas fever in that calves will acquire immunity much more readily than mature cattle. For some reason all of the calves imported by the dealers for the first two or three months after the transfer of this work were very young. They often developed rinderpest in twenty-four hours after arrival, and despite all efforts the death rate ran high. We then demanded older animals. They were furnished, but many of them proved to be from 18 months to 2 years of age and pregnant. The latter almost invariably aborted on developing rinderpest and many of them died. After many discouragements one dealer imported a lot of 16 particularly fine calves which he desired to have inoculated for his private herd. He was finally prevailed on to sell them to this bureau. It was a matter of great surprise to find that after being inoculated for rinderpest they developed Texas-fever symptoms, and 13 of the lot died. It seems evident that they had not been exposed to ticks in China and were not immune to Texas fever.

At another time a lot of calves purchased developed foot-and-mouth disease simultaneously with rinderpest, which caused a few deaths.

One lot of 10 half Shorthorn calves raised at La Trinidad Stock farm, Baguio, was inoculated without a single death. If this is an indication of what can be done with native-raised calves having a strain of improved blood, it may yet prove economical to raise all of the calves required in the manufacture of vaccine.

The total number of calves purchased during the six months was 130, of which 42 died. However, in the face of this severe loss the immune heifers are considered so valuable that one cattle dealer has agreed to furnish all calves required in the manufacture of vaccine, and will stand all losses by death, provided he shall not be required to pay for feeding them while in charge of the government, and that all living calves shall be returned to him after being used for the production of vaccine. His offer will be accepted for a limited time to try the system.

INOCULATION OF BULLOCKS FOR PRIVATE PARTIES.

There has been considerable demand from private parties for the inoculation of cattle for work and breeding purposes. In many cases these requests have assumed the form of urgent demands to accept cattle for treatment when affected with rinderpest.

On account of lack of shed and stall room only the following were taken:

Owner.	Received.	Condition.	Died.	Immunized.
Roxas.....	54	Bullocks, all infected and exposed.....	2	52
Verstockt.....	24	Bullocks, healthy.....	2	22
Olegario.....	5	Carabao, 1 infected, 4 healthy.....	1	4
Flameño.....	6	Carabao, advanced stages rinderpest.....	4	2
Lichauco.....	2	do.....		2
Miller.....	1	Bullock, healthy.....		1
Flameño.....	3	do.....		3
Do.....	1	Australian heifer, advanced stages rinderpest.....	1	

CONDITIONS AT CLOSE OF YEAR.

At the close of the year the serum herd contains 107 bullocks, and is producing serum at almost double the average rate of the past six months. We have not been able, however, to meet the demand for serum and shall be compelled to further increase the herd. It will also be necessary to make temporary repairs on the sheds, walks, and corrals, which have recently not been put in good condition pending the removal of the serum herd to Alabang. This removal will now be delayed at least half the year on account of the rainy season.

ALABANG STOCK FARM.

LOCATION.

The Alabang stock farm is situated on the Muntinlupa friar estate, about 22 kilometers south of Manila, on the west shore of Laguna de Bay. This location was selected after more than a year's search as the most suitable place available for a stock farm in the vicinity of Manila. The government dairy is now established at this farm, and the serum laboratory will be transferred there when the necessary buildings shall have been erected. The farm, which was established on December 30, 1906, by the shipment there of a herd of 92 cattle, contains 240 hectares, all of which is available either for cultivation or pasture. As there were no buildings at that time, a temporary camp was established.

Alabang is at present reached by lake steamer calling at Muntinlupa, which is 2½ miles from the farm, and from which the bureau operates a small sailboat. The Batangas line of the Manila and Dagupan Railway has been graded just in front of the farm, and it is understood that this line will be in operation in a very short time. If there is established a favorable schedule on this railroad, Alabang can easily be reached by train in less than one hour from Manila. This will in many respects greatly facilitate the work of this farm, especially in the shipment of milk. We are now able to make but one delivery of milk each day, and the transportation of this milk from the farm to the civil hospital in Manila requires over five hours.

SOIL.

The Alabang farm lies immediately back of the level rice lands which border the lake shore. It contains a small amount of rice land, but the greater part of its area is undulating and hilly, with outcroppings of rock and coarse gravel on top of the hills. The surface soil is underlaid by a heavy stratum of soft, shaley rock, locally called adobe stone. In general, however, the soil is of good depth, fine texture, gray to black in color, and was no doubt formed by the action of Taal Volcano.

WATER SUPPLY.

One local stream runs diagonally across the farm for a distance of more than 2 kilometers and furnishes a fair supply of water throughout the year. Small rivers on the north and south sides of the farm form part of the boundaries. The mouth of the largest river assumes the form of a deep estero, in which the water level of the lake is maintained to within a very short distance of the farm. Should it prove necessary, it is entirely practicable to pump the water from this deep portion of the river to the hills a little farther back, from which it could be easily distributed to irrigate all of the lower lands. A very good site for a small storage dam 12 meters above the lake level has been found. The present water supply is of a temporary nature, consisting of a boiler and a steam pump, used to fill a small tank from the river in the center of the farm. It is contemplated that when permanent buildings are erected an artesian well will be bored near the center of the group, from which water may be pumped for the regular supply.

BUILDINGS.

There were no buildings on the farm at the time it was established, but a few grass sheds were soon erected. Since that time 5 temporary wooden buildings and a bridge across the main river have been constructed, and a contract will be let at once for the construction of a dairy barn with a capacity for holding 50 milk cows. Plans and specifications have already been prepared

for a serum laboratory, sheds for 150 serum bullocks, quarantine station, superintendent's house, building for the Maltese milk goats, implement shed, and quarters for laborers. All of these buildings will be constructed beginning at the close of the present rainy season.

LIVE STOCK.

The herd sent to this farm six months ago consisted of 92 head of cattle, mostly young stock, and 5 Berkshire sows. Since then 5 cows and calves, 30 head of Chinese cattle, about 20 head of horses, 28 head of Maltese milk goats, 2 Australian Berkshire boars, and 3 sows have been added to the herd, so that now it is assuming the appearance of a stock farm. Among the stock sent to this farm were a lot of Australian heifers received from Townville last September. These heifers were inoculated against rinderpest, with a loss of 5 at that time, and after having been sent to Alabang 9 more have died of various causes. There has been no exception to the rule that imported European and American cattle having rinderpest suffer severe emaciation and make practically no growth within a year after taking the disease.

INTRODUCTION OF MALTESE GOATS.

The bureau of agriculture sent a representative to the island of Malta in October, 1906, for the purpose of purchasing and shipping to Manila 20 Maltese milk goats. It was known at the time that these goats were the carriers of the infection of Malta fever, and instructions were given to have all animals purchased thoroughly examined, and certified free from the infection of this fever before shipment. This necessitated the inspection of several hundred head, the employment of experts, and the use of microscopic and laboratory methods for the determination of the presence or absence of the disease. The work was beset with many difficulties on account of the ignorance and superstition of the natives of Malta, and it is highly probable that we could never have obtained these goats but for the good offices of the American consul stationed at Valletta. They were finally secured, placed in quarantine, and later shipped by the Peninsular and Oriental steamship *Palmero* by way of Hong-kong, with a native Maltese goatherd in charge. They fared quite well on the voyage, only 1 death occurring. Another animal, however, was injured so that she died soon after arrival in Manila. Several kids were born en route and the animals have bred freely ever since their arrival. Five of the goats died after being sent to Alabang, apparently from eating a poisonous vine growing on that farm. At the end of six months, however, the original herd of 4 males and 14 females arriving in good condition in Manila now makes a total of 28 head. They have apparently done well at all times and give every promise of success. While it is known that some of the goats of this herd will give from 5 to 8 pints of milk per day, this much has never been taken, as it is desired to give the kids a liberal supply to insure their rapid growth and maximum development. They are much larger than the common goats, of thin conformation, and have a heavy coat of long hair with light brown or liver color and white predominating. It is thought that they will be particularly valuable as milk-producing animals in the Philippines, on account of the high price of dairy cattle, the severe losses sustained among such cattle, when imported, and the lack of knowledge among the people concerning the dairy business.

CONDITION OF STOCK.

All of the stock on this farm has kept in excellent condition, although taken there in the dry season and fed only a small amount of grain. The wide strip of land uncovered by the going down of the lake in the dry season has been covered with a good growth of Bermuda and other grasses, and has furnished excellent pasturage. The Chinese cattle have not been given any dry feed at all and have done particularly well.

There are now on this farm 14 calves, from a few weeks old to six months. They are unquestionably in the best condition of any calves ever raised by this bureau. The horses so far sent to this farm have been, with a few exceptions, the culls and condemned stock from other farms. If these horses do well at Alabang, it is contemplated that more will be sent there during the coming year. The hogs have been kept in a corral, where they have plenty of room to exercise, and have done exceptionally well at all times.

IMPROVEMENTS.

About 6 hectares of land have been brought into cultivation and planted in such forage crops as corn, sorghum, and guinea grass. The permanent improvements contemplated on this farm will be undertaken as soon as the appropriation act has been passed, and will include not only the erection of buildings, but also the clearing of land, building of roads, fencing of the entire farm, and other necessary improvements incident to its operation as a first-class stock farm.

TRINIDAD STOCK FARM.

LOCATION.

This new farm was opened during the closing months of the last fiscal year. It is located in what is locally known as the Little Trinidad Valley, which opens out into the large Trinidad Valley about 6 kilometers north of Baguio.

SOIL.

The small valley contains about 16 hectares of fairly level land, which for the most part consists of a stiff, red clay soil. It has all been under cultivation at one time or another by the Igorots, who used it especially for growing sweet potatoes. The hill land immediately surrounding this valley consists of clay mixed with a great quantity of broken stone of all conceivable sizes, is very rugged, and only accessible by following around the hills in certain directions. The land under the control of this farm is all quite broken, being frequently cut by deep canyons, and is estimated to contain about 400 hectares.

WATER SUPPLY.

The water supply at the buildings comes from a small spring, the water of which is conducted down to the barns through a 1-inch pipe. In the heart of the dry season it barely furnishes enough water for all of the stock on the farm. About a kilometer distant from the buildings, across a rugged backbone of the hills, is a small river in the bottom of a canyon. This river can not be reached at a point immediately opposite the farm by the live stock, but a trail has been graded up the stream to a point where the animals can readily gain access to it. Should the water supply in the small valley fail, it will be necessary to put in either a hydraulic ram or pump in this river and carry the water over the top of the intervening ridge to the barns.

IMPROVEMENTS.

The grazing lands are so mountainous and rough in nature as to necessitate considerable work in the building, widening, and opening of trails and roads in order to afford the stock access to the different parts of the range. Other work on the range consisted in fencing along precipices, the filling up of deep and dangerous holes, the building of five grass sheds for the protection of stock during severe storms, the completion of $2\frac{1}{2}$ miles of wire fencing bordering on one section of the pasture, and of fencing to subdivide the grazing lands in order to protect the range.

The improvements around the main quarters have consisted in the construction of a stallion and breeding corrals, paddocks for brood mares and colts, and a grass wagon shed; in laying a pipe line which supplies the stabled stock with spring water, plowing of new lands, leveling of mud fences which were of no practical value to the farm, improving the main wagon road by giving it a top dressing of broken stone, and digging ditches to drain the meadow land.

Considerable labor has been performed on the stallions to keep them in proper condition for breeding. This required daily exercise under the saddle and the most careful and thorough grooming.

The condition of the brood mares and burros was rather poor at the beginning of the fiscal year, on account of the poor range where they had been kept, and a great deal of time was required to get them back into good breeding condition.

PASTURES.

While the grazing lands controlled by the stock farm comprise about 400 hectares, fully 25 per cent of this is worthless on account of its being inaccessible to large animals, and the remaining portion is a poor class of pasture land. The range is subdivided into several sections and the cattle have been kept in fair condition by moving them from field to field. During the dry season, when the mountain pasture was exhausted, the cattle were removed to the Trinidad Valley, which is public grazing land. The principal grass in this section is a species of wild rye and grows very slowly, even during the rainy season. After being grazed during the dry months, the grass on the exposed range dries up and is almost worthless as a forage. Investigations last March showed many places on the range to be as clean as if swept by fire. Only in the canyons and gulches can any good grass be found during the dry season, and these places are often dangerous to stock on account of the pitfalls, underbrush, and deep holes. The loss by death of cattle grazing in the canyons last year was very large. The superintendent of the farm estimates that to sustain one cow and calf per year on this range requires about 6 hectares of grazing land. The present size of the herd has taxed the pasture to its full capacity the past year. There is but a small area of grazing land on which imported horses, and mares with colts, can graze with any degree of safety.

STOCK ON HAND.

Stallions, imported, 2; mares, imported, 14; mares, native, 20; colts, yearling male, 1; colts, yearling fillies, 4; colts, suckling, American, 4; colts, suckling, grade, 5; burros, jacks, 6, jennets, 11; bulls, imported, 3, grade, 3; cows, imported, 1, native, 47; steers, grade, 6; calves heifers, grade, 23; bullocks, 17; boars, Berkshire, 1, grade, 2; sows, grade, 1; goats, 4; sheep, 8; making a grand total of 185 domestic animals at the farm.

INCREASE BY BIRTHS.

The increase by births for the past year was as follows: Colts, American bred, 5; colts, grade, 7; calves, grade, 13; steers, grade, 6; sheep, 2; goats, 1.

BREEDING.

The Arabian "Beder" and the Morgan "Duke of Albany" are the two stallions at the head of the stud. Both horses have been in excellent condition to perform the duties required of them. It has been found difficult to induce the Igorots to avail themselves of the opportunity of breeding their mares to these horses, and only by great persuasion were three native Igorot owners of mares induced to breed to "Beder." The result of the breeding performed this year is as follows: "Beder" served 4 imported and 8 native mares, property of the bureau of agriculture, 1 American mare belonging to the army, and 5 other native mares—a total of 17. "Duke of Albany" served 14 American mares, property of the bureau of agriculture, and 8 American mares belonging to the army—a total of 19. The Galloway bull served 15 cows belonging to private parties, besides running regularly on the range with the government cattle. The Devon bull was bred to 5 cows belonging to the bureau of agriculture. The Berkshire boar served about 30 outside sows and the grade boar about 25.

One grade Galloway bull, 2 years old, is doing service at Mr. Lewis's stock farm near San Fernando, La Union, and one grade Galloway bull, 2 years old, is doing service at a small stock farm in Lepanto-Bontoc. One Australian bull is doing service on another stock farm at Bua, Benguet. The breeding season of the horses commenced on November 1, 1906, and ended July 31, 1907. This period was selected because the mares would have their colts between October 3 and July 2, thereby avoiding foaling during the severe rainstorms which annually visit this section of the country during the months of July to October, inclusive, and the stallions needed a rest of a few months each year to recuperate after a vigorous season of stud service. The cattle, sheep, goats, and hogs have been allowed to breed the entire year. It is the intention during the ensuing year to separate the bulls from the cows as has been done with the stallions.

CARING FOR STOCK.

The past year's experiences in handling equines has demonstrated that, to successfully raise them here, they should have daily care and attention and should not be required to rustle for themselves. During the rainy season they should have access to proper shelter. The care required consists in a liberal daily ration of hay and grain, stabling and grooming. The imported horses and cattle have not done well on the range. At times during the rainy season (clear weather) they will do a little foraging, but if left to subsist themselves they rapidly fall off in flesh. The native-bred horses and cattle are much better rustlers than the imported stock, and by keeping as close to their natural habits as possible without putting them to severe hardships they will thrive fairly well.

WOOD TICKS.

The ticks have been a great source of annoyance to the horses and cattle, particularly during the dry season. The calves and colts have had to be bathed with dip on an average of every six weeks, and yet ticks could be found on them at all times of the year.

CLIMATE—HEALTH.

The climate in this vicinity is temperate, mild, and cool for the greater part of the year. During the rainy season the rains are copious and frequent. The climate seems to agree with the health of all domestic animals on the farm and during the past year the stock has continued to be free from malignant, contagious, or infectious diseases.

MORTALITY—LOSS.

The death records of stock show that 5 cows died from accidents received in pasture, 1 American suckling colt from diarrhea, 1 suckling burro colt from acute peritonitis, 4 adult burros from accidents received in pasture, 2 bullocks from old age, 1 young steer from debility, 1 native mare during period of parturition, 1 colt from accident in pasture, 1 lamb was killed by a dog, 1 pig was drowned, 2 cows could not be accounted for (probably stolen), and 1 carabao was stolen.

FORAGE CROPS.

Experiments in the raising of forage crops have been very limited. The most successful forage plants so far developed are oats and Bermuda grass. Oats sown on well-manured land produced a healthy, quick, luxuriant growth, but failed to produce seed on maturity, the heads of the plants being empty. The green oats if cut and cured make fair hay. Bermuda grass can be found growing in many parts of the Trinidad Valley, and when transplanted does exceedingly well. It has a tendency to grow during the dry season when other grasses are apparently dead. Guinea grass, raised from transplanted roots sent here from Manila and set out in well-manured rich soil, has done remarkably well, and may be a valuable forage plant for this section of the country. The seed of the Guinea grass was planted in several places under several different conditions but failed to germinate. Volunteer clover when transplanted grows very well in the rainy season, but perished during the dry months. By irrigation, however, clover may be successfully raised.

IMPROVEMENTS CONTEMPLATED.

During the coming year it is planned to erect a separate building to contain sufficient stalls for all the stallions kept at this farm. It has proved quite an unsatisfactory arrangement to keep them in the same barns with the mares and colts. The main hill range lying west of the buildings will have to be fenced to protect it against the invasions of outside stock. It is also planned to fence in a portion of the main Trinidad Valley, now used as public grazing land, and to utilize it both for the grazing of the government stock during the dry season and as a breeding station for horses and cattle from the surrounding country. Grasses and clover will be put out on the level lands surrounding the buildings and small plats of Bermuda and Guinea grasses will be set out

all over the range, to be used in future as a source of supply for the further extension of these grasses. Experiments will also be made on these ranges with imported clovers and grasses, such as lespedeza and orchard grass.

RECOMMENDATIONS.

The following recommendations are respectfully submitted with a view to bettering the services rendered by this bureau:

1. That the provincial force of employees be increased by the addition of 1 special agent or superintendent of extension work, whose special duty it shall be to advise the people in the provinces of the work done by this bureau and secure their cooperation; 5 veterinarians, desired on account of the increased work in the control of infective animal diseases; 3 agricultural inspectors, and 9 assistant agricultural inspectors with the same qualifications as inspectors. These inspectors and assistant inspectors are desired as general agents of the bureau in the provinces to supervise the crop-reporting service and to investigate all questions relating to agriculture and animal industry.

2. That there be passed a general veterinary sanitary law^a for the Philippine Islands, under the provisions of which the bureau of agriculture can control the movements of live stock and thereby prevent the further introduction of infectious animal diseases.

3. That stock yards with suitable isolation, and with a sufficient capacity to hold all animals imported into these islands or otherwise brought into or through these ports, be established in the cities of Manila, Iloilo, and Cebu. These stock yards are designed to be used also as quarantine and inoculation stations during the time necessary for the eradication of the fatal infectious animal diseases now existing in the islands. Nothing short of absolute eradication of these diseases will ever restore complete prosperity, and it is recommended that whatever action be taken this object be kept in view.

4. That small inoculation stations be established at Batangas, Province of Batangas; either Bacolod or Silay, in the Province of Occidental Negros; and Legaspi, in the Province of Albay; to be used as quarantine and inoculation stations so long as the necessity for them may exist.

5. That suitable sites be selected and experiment stations established for work with the standard crops of the islands—such as abaca, cocoanuts, tobacco, and rice. None of the farms at present operated by this bureau are located so as to be adapted to all of these crops which furnish our principal commercial products. If one satisfactory site could be found on which all of them would grow well, it would be just that much better.

6. That small temporary stations be established at Sablan and Naguilian on the trail from Bagulo to San Fernando, Union, and operated in connection with the Trinidad farm, with a view to testing the growth of different crops at varying altitudes.

7. That the present sugar farm in Occidental Negros be converted into a general experiment station, with a view to working with crops particularly adapted to the Visayan Islands. It is probable that the proposed experimental work with sugar cane, abaca, rice, and cocoanuts can be carried on at this farm, which is also suited to work in animal industry, especially with cattle and hogs.

G. E. NESOM,

Acting Director of Agriculture.

The SECRETARY OF THE INTERIOR,

Manila, P. I.

^a On October 10, 1907, act No. 1760, "An act to prevent the introduction into the Philippine Islands of dangerous communicable animal diseases, to prevent the spread of such diseases within the islands, and for other purposes," was enacted by the Philippine Commission.



APPENDIX G.

REPORT OF THE DIRECTOR OF THE WEATHER BUREAU.

DEPARTMENT OF THE INTERIOR, WEATHER BUREAU,
Manila Observatory, July 31, 1907.

SIR: In this report for the year ended June 30, 1907, I shall follow, in general, the outlines of previous annual reports, viz: I. Manila central observatory and its departments. II. Secondary stations. III. Personnel. IV. Expenses of the weather bureau. V. Difficulties and plans.

I. MANILA CENTRAL OBSERVATORY.

DEPARTMENTS OF THE CENTRAL OBSERVATORY.

(a) *The meteorological department.*—(1) One observer, at least, is on duty from 6 a. m. to 7 p. m., Sundays and holidays included. This arrangement, since it was put into practice two years ago, has worked so satisfactorily that it will be continued. As a complement to this, a minor employee has been secured, in addition to the official force, to be ready during the night to answer any calls by telephone and to give notice to some of the staff should anything important happen. Besides, as the main door at the observatory is closed, as a general rule, at about 8 p. m., an electric bell has been connected with the door for the convenience of those who after that time may need to see the director or any one of the staff or to deliver any urgent telegram. Whenever the weather is threatening some of the observers are on duty, even during the night, according to the importance of the work to be performed.

(2) It has been found by long experience that the telegraph operator has to be on duty longer than the office hours, but owing to his liberal salary, which would be enough to maintain two operators, he is willing to secure an assistant without extra cost to the government.

(3) A source of no small work, especially for the staff, is the many calls by telephone day and night from persons requiring information whenever the weather becomes complicated or some storm signal is hoisted in Manila. In connection with this I may add that sometimes these calls prove a nuisance, especially during the night, owing to the perfectly irrelevant questions asked. To avoid this inconvenience, a short bulletin is telephoned to the central office about weather conditions for the benefit of all callers, with the request that the observatory be called only in extraordinary cases.

(4) It is the intention of the staff to select and improve any practical means tending to spread rapidly the warnings of the observatory through the city whenever the weather is threatening; and to this end there has been some correspondence between the director and the secretary of the interior, with the result that at the request of the secretary of the interior the municipal board was directed by the acting secretary of finance and justice, the Hon. Henry C. Ide, on July 9, 1906, to issue the necessary instructions to the police department to give warning to the inhabitants of the city whenever the department is notified by the weather bureau of the approach of a typhoon dangerous to the city. On July 18 Mr. P. G. McDonnell, member of the municipal board, sent a copy of the committee report, which was approved by that board in its session of the morning of the same day, on the cooperation of the police department in spreading among the people of Manila the warnings of the weather bureau when requested by the observatory, together with the information that arrangements were made for connecting the observatory and the police headquarters by a direct wire, which fortunately passes the corner of the city hall, making the expense very insignificant. Every policeman on duty reports over the police-

alarm system to his station once each hour. In this way it will be possible to communicate the news of the approach of a dangerous typhoon to every beat in the city within the space of not more than one hour and a half from the time it is received from the observatory, and the policemen in turn will promptly spread the information to all of the residences on the various beats. It is believed that this method will be entirely satisfactory and will confer a considerable benefit, as it was practically tested in September, 1906.

(5) Another arrangement has contributed to spread rapidly the news of coming typhoons, even throughout the islands, namely, the transfer of telegraphic business to the bureau of posts, so that it shall receive and transmit weather notes to and from Manila as a function of that bureau. This arrangement was first put in operation January 1, 1907, but owing to the fact that no other bureau is allowed to receive and transmit telegrams through the bureau of posts, it has been considered advisable by the Commission to restore the old law of the payment for telegrams, thus putting our bureau on the same footing as all other insular bureaus in that regard.

Beside the ordinary daily dispatches to China, Formosa, and Japan, 28 special typhoon warnings were issued to foreign centers during the year, each of them having been forwarded to Halphong, Hongkong, Shanghai, Taihoku, and Tokio.

In the meteorological department instruments are compared and certificates of comparison issued gratis. The number of barometers observed, and when necessary cleaned and corrected, was 205.

(b) *The astronomical department.*—(1) Rev. Father Juan Comellas, the astronomer, was appointed assistant director in November, 1906. He is entirely competent to look after this department. Almost four months were taken for the improvement of time service. The transit instrument has been cleaned and readjusted and one of the chronographs with a sidereal time clock transferred to the meridian transit room.

(2) The adjustment of the magnificent Riefler mean-time clock up to the present has been unsuccessful, owing partly to the effect of perceptible earthquakes, partly to the difficulty in the perfect exclusion of the air from the glass box of the clock, and finally to the inconstancy of the electric-battery currents for self-winding.

(3) The standard sidereal clock has been provided by our mechanics with electric contacts and has been connected with the chronograph for the observations of star transits.

(4) After each sensible earthquake the wires of the meridian-transit-instrument-reticule are to be remeasured to determine the instrumental constants.

(5) An exact readjustment of the equatorial has commenced and has taken several weeks, without being perfected as yet. The pier of the instrument had to be modified for the adjustment in azimuth at a cost of ₱414. The mechanical device for opening the shutter of the dome was found deficient since its construction and had to be improved at no small cost.

(6) The number of the chronometers compared and rated was 15, 14 less than in the past fiscal year. This decrease may be due possibly to better facilities to observe the time ball from the new port, or to the fact being more widely known that there is telegraphic transmission of time by wire to the most important ports and telegraphic stations of the islands.

(c) *The seismic department.*—(1) During the period covered by this report, 126 earthquakes were reported from the islands. In Manila only 10 local earthquakes have been experienced, all of them of very moderate intensity, except the one on April 19, which was strong here and violent and destructive in Camarines. Of the 126 shocks felt in the archipelago two were violent, one in Camarines Province on April 19 and another in Ilocos Norte on May 25.

(2) Special mention is to be made of different periods of shocks more or less protracted and very frequently without any of them being violent. In northern Luzon a series of shocks occurred from the afternoon of the 17th to the midday of the 18th of October. In the northeast region of Mindanao from the 20th to the 23d of December more than 12 perceptible shocks were felt, but no one strong. In Romblon and adjacent islands from the evening of the 23d to the early morning of the 24th of January various shocks of slight intensity were experienced. In Masbate small tremors occurred on the 3d and 4th of April. In Camarines after the violent earthquakes of the 19th of April a series of aftershocks occurred almost every day up to May 12, the frequency being very extraordinary on the 20th, 22d, 26th, 29th, and 30th of April. In the extreme north of Luzon many light shocks occurred on the 4th of May. A set of small shocks were felt on the eastern coast of Samar on May 16,

and in the northeast of Mindanao and south of Leyte on the 17th, 19th, and 20th of the same month.

(3) The violent earthquakes of Camarines on April 19 have been registered in all the seismic stations in Europe and we suppose in those of America. Other earthquakes of less intensity were recorded in many seismic stations, as, for instance, that of October 17 in northern Luzon, of July 11 in the eastern coast of Mindanao, of October 18 in the same region, and of May 25 in northern Luzon. It may be ascertained that those earthquakes which without being violent in the islands were registered in Europe and in America had their epicenter in the Pacific not far from the archipelago, where, according to the very recent observations and soundings of the German steamer *Planet*, lies the greatest sea depth ever found up to the present time.

(4) At the end of the year 1906 two horizontal pendulums (Bosch-Omori type) made by our mechanics were installed, which since that time have given very excellent records of distant earthquakes, and in that respect the instrument has resulted better than the Vicentini microseismograph, which being more universal is unsurpassed to register both local and distant earthquakes. The records obtained with these instruments may be classified as follows: Records of earthquakes whose epicenter was located in the archipelago or not far from it, 200, and those of distant earthquakes, 40. Among them the most remarkable were that of Valparaiso on August 16, that of Sumatra on January 4, and that of Mexico about the middle of April.

(5) The record of the Valparaiso earthquake is by far the most interesting. It was published in our bulletin for August, 1906, and it is highly gratifying to know how welcome this seismogram has been to scientists. *Nature*, a weekly illustrated journal of science, No. 1956, volume 75, for April 25, 1907, page 613, says: "The bulletin of the Manila weather bureau for August, 1906, contains a reproduction of what is probably the only complete seismogram of the Valparaiso earthquake in existence. The distance from the centers of the North Pacific and Chilean earthquakes of August 17 was such that the disturbance due to the former had practically died before the arrival of the latter. The first preliminary tremors commenced at 1 hour 13 minutes, Greenwich time, and lasted until about 1-21. The instrument being a Vicentini microseismograph, with a vertical pendulum of 1.5 meters length, the third-phase waves, which give the greatest amplitude with a slow period horizontal pendulum, are of small size, and it is largely due to this that the earlier phases of the record of the Valparaiso shock are so little complicated by the end portion of the preceding one."

A copy of this seismogram, at the request of the consul for Chile in Manila, was sent to the secretary of foreign affairs of Chile, and the original has been requested by cablegram by the international committee of seismology, to be inserted in its report and presented to the International Congress of Seismologists to be held in Rome next September.

(6) On January 4 our Vicentini seismograph registered two distant earthquakes in such a way that while the slow waves of the first were recorded the first preliminary tremors of the second began to be marked. Neither the seismograms of Europe nor those of Shanghai show more than a single record corresponding to a shock in Sumatra, the second one, corresponding to our records, not being located as yet. This fact makes us suspect that the epicenter of the second earthquake lies in the western Pacific some 5,000 kilometers from Manila.

(7) From all the above facts we may conclude that during the fiscal year 1907 great seismic activity has been developed in the western portion of the Pacific where the archipelago lies, as well as in the eastern Pacific along the western American coasts. Among the 126 earthquakes reported in the archipelago 6 may be termed great earthquakes, as their waves reached Europe and America, although fortunately none of these caused such a destruction of lives and property as those of the eastern Pacific.

(d) *Magnetic department.*—This department has remained as stated in last year's report. Little hope is now entertained of erecting this department in Baguio, on Mirador Mountain, even in the supposition that a steam railway will be constructed from camp No. 1, as the probability of an electric line to Trinidad or to Cervantes from Baguio would surely destroy the installation within a few years.

(e) *The mechanic's shop.*—The most important work has been the construction of the horizontal pendulums, which were put into operation at the end of the year 1906. There has been also a slight decrease in the amount of repairs

requested by other bureaus, owing probably to the betterment of equipment of tools, both in the bureau of science and in the navy-yard. It would be well to detach from time to time one of the mechanics and send him on a tour of inspection of the instruments in different stations.

Crop service.—In our last report we stated, in reference to this service: "No action has been taken by the authorities relative to the plan of a more extended crop service, proposed in last year's report. Nor do I believe that under the conditions prevailing at present anything can be done to improve this service, highly deficient though it be." It has always been difficult to awake interest in it. Finally, according to a statement in a pamphlet from the bureau of agriculture, that bureau will undertake this service as one of its functions, and there is hope that to avoid duplication the weather bureau will be relieved of this duty and be able to devote all its energies to more proper investigations."

IV. EXPENSES OF THE WEATHER BUREAU.

I beg to submit a summary of the expenses of the weather bureau during the fiscal year to June 30, 1907. I shall add, also, for your information, the auditor's account:

Weather bureau—Summary of the fiscal year July 1, 1906, to June 30, 1907.

FUNDS AVAILABLE.

Retained balance, fiscal year 1906.....	₱1, 703. 07
Appropriation for the fiscal year 1907, act No. 1527.....	114, 500. 00
Interbureau voucher deposited.....	64. 40
Total.....	116, 267. 47

EXPENDED.

Salaries and wages.....	₱68, 618. 90
Printing and binding ^b	17, 169. 64
Telegrams and cablegrams, including ₱6,000 transferred to bureau of posts.....	13, 217. 45
Postage on correspondence and publications.....	2, 862. 54
Transportation of persons and freight, per diem.....	951. 14
Rent of offices and instruments.....	9, 000. 00
Miscellaneous expenses.....	738. 98
Total.....	112, 558. 74

The total expenditure of ₱112,558.74 includes the following liabilities, taken over from the fiscal year 1906:

Salaries and wages.....	₱70. 00
Printing and binding delivered during June, 1906.....	561. 15
Collect messages received during June, 1906.....	774. 54
Total.....	1, 405. 69

LIABILITIES, FISCAL YEAR 1907.

Bureau of supply, bill for instruments, about.....	₱1, 500. 85
Miscellaneous small accounts, aggregating about.....	250. 00
Total.....	1, 840. 85
Total of funds available.....	116, 267. 47
Total of payments made.....	112, 558. 74
Unexpended balance.....	3, 708. 73

^a Data in regard to the following have been omitted and are on file in the Bureau of Insular Affairs, War Department: Improvements of the central observatory, publications, secondary stations, and personnel.

^b The cost of printing and binding was in reality ₱17,222.80. The item given includes a credit in favor of the weather bureau resulting from the sale of documents.

Adding to the payments actually made the difference by which the liabilities arising during the fiscal year 1907 exceed those taken over from the preceding year, ₱435.16, we find that the expenses incurred are well within the appropriation, being ₱113,013.90.

AUDITOR'S ACCOUNT.

CREDIT OF APPROPRIATION.

Retained balance, fiscal year 1906.....	₱829. 32
Appropriation for fiscal year 1907, act No. 1527.....	114, 500. 00
Interbureau voucher deposited.....	64. 40
Deposited by insular disbursing officer.....	5, 500. 00
Total	120, 893. 72

DEBIT TO APPROPRIATION.

Drawn in favor of disbursing officer.....	98, 380. 00
Transferred to bureau of posts.....	6, 000. 00
Paid to bureau of supply (before I.-B. voucher).....	543. 30
Settlements of interbureau vouchers.....	13, 337. 69

Total	118, 260. 99
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Total credits	120, 893. 72
Total debits	118, 260. 99

Treasury balance	2, 632. 73
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INSULAR DISBURSING OFFICER'S ACCOUNT.

DEBITS.

To balance of fiscal year 1906.....	₱873. 75
To accountable warrants in his favor.....	98, 380. 00
To refund to appropriation.....	65. 85
Total	99, 319. 60

CREDITS.

By expenses of the weather bureau.....	92, 743. 60
By refund to treasury.....	5, 500. 00

Total	98, 243. 60
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Total debits	99, 319. 60
Total credits	98, 243. 60

Balance	1, 076. 00
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V. DIFFICULTIES AND PLANS.

(a) *Daily weather chart.*—The data compiled daily in the central office are such that the time has come to elaborate a weather map, giving the weather conditions in the islands and in the whole Far East every day for 6 a. m. This map is ready about noon each day, and it is the intention of the staff to have prepared a small number of copies every day for the general benefit of all concerned.

Up to the present time we have been confined to having the map drawn on a board in the office and filed in special blanks. This work of making up the weather map may be considered the most practical and the most important work of the office. It requires the cooperation of the best part of the force of employees and the greatest care in the transmission of the home and foreign telegrams. To secure the latter a correspondence with the superintendent of the Australasia and Eastern Extension Telegraph Company in Manila, and through him with the general manager of this company for the Continent, has proved very successful, as at present, through the kindness of this company, at

about 11 a. m. every day, cablegrams, free of any charge, corresponding to the morning, from Japan, Liuklu Group, Formosa, and the China coast, are in the office to help in drawing the weather chart and making out the weather forecast for the next twenty-four hours.

(b) *Difficulty in securing proper employees.*—It has been always difficult to secure good employees for this office and for the stations, as there is no way of securing scientific training in meteorology or seismology in the colleges, schools, or university, and the observatory has to prepare its own observers to pass the civil-service examinations to supply the stations and the office. Fortunately the personnel is so faithful that there is scarcely any change from year to year. See report for the fiscal year 1904-1905, appendix, roster of Manila observatory. But whenever a new instrument is procured, new practice and instructions are required, and from time to time reliable methods are to be renewed by ordering some of the observers to come to the central office for practice. For that purpose a model of a first-class station has been erected on our grounds and is kept in working order for instructing those who are to be examined and to improve the practice of our own observers.

(c) *Monthly summaries of meteorological elements.*—In the belief that a monthly summary of the meteorological elements for Manila would be of interest to the general public, especially if published immediately after the close of the month, the weather bureau will prepare such summary beginning July, 1907. Forms have been printed to be filled at the expiration of each month and distributed to the newspapers for publication.

It is also intended to have another form, which will give the normal or average values of the various meteorological elements for each month, as deduced from many years' observations to be published at the end of the previous month. Thus the public will be informed on the second or third day of each month as to the actual conditions during the previous month, and on the last day of the month of what it may reasonably expect the weather to be during the month to come.

(d) *Publication of old observations.*—By some combination of circumstances observations of a few back years were not printed. The appropriation for printing since 1885, which was rather meager, having been wholly exhausted in printing the meteorological curves, some pamphlets, blanks, other minor items, and the records for the years 1885, 1887, part of 1888, 1890, and all successive years up to the American occupation. Previous to the year 1885, the records for 1884 and part of the year 1875 and 1877 were not printed, on account probably of want of means. The originals are on file, and it has been deemed advisable to now print these observations to complete the records and to cover the requests we have from time to time from other institutions. A contract has been made with a private printer in Manila to have all these observations printed within a few months, the observatory defraying from its private resources all the expenses incurred thereby. All this work will be surely done before the expiration of the next fiscal year, 1908. The expenses will amount to several hundred dollars.

(e) *Synchronization of clocks.*—As the rate of the Riefler's pendulum is not yet satisfactory, an attempt to synchronize our clocks has not yet been made, but it is hoped that the work will be undertaken in the near future.

(f) *Monthly seismic bulletin.*—Records of seismograms are in considerable demand. Provision has been made to have a short seismic bulletin issued every month for exchange with the most important geodynamic observatories of the world, previous to the regular publications of our monthly bulletins, and as an advance sheet of the same. Dr. E. Rudolph, of the International Seismological Committee, has made an application for the original of the most important seismograms, which has been granted reluctantly on condition that they be returned, and only a few were allowed for the purpose of determining the instrumental constants and other features which may be discovered by comparing them with seismograms of other instruments.

(g) *Third-class observers.*—There is no small difficulty in finding able observers for Class III stations, which are the most numerous and the most useful to the bureau. The salary being moderate, men of fair ability will not go to such remote places as Caraga, Davao, Santo Domingo, etc., unless there be some other inducement, which is scarcely ever found. On the other hand, it is very important to secure natives who are willing to stay long periods in these places, otherwise the travelling expenses would not be compensated by the benefit and usefulness of the stations. But the long permanency, without inspection, which

could not be carried on very successfully, has led to practical difficulties which experience has shown: systematic errors in observing, due to inattention to instructions, negligence in carrying out new instructions, errors due to improper care of the instruments, etc. The only way of avoiding them is to order these observers to come to the central office to renew practice and methods at their own expense as a sort of fine or compensation. This has been done in some instances with success.

(h) *Use of weather code.*—The statements made as to the difficulty in the use of the code for the transmission of the weather note in the last report have been confirmed by experience. Weather conditions are not stereotyped as found in nature; in fact, it has been often found impossible to select a code word which covers the situation. Supplements to the code may diminish the difficulty, but not solve the problem. Hence the transmission of the weather note will be a source of immense expenditure, and, curious enough, this will naturally increase as the benefit increases or as the warnings are more widely spread.

Very respectfully,

JOSÉ ALGUÉ,
Director of Weather Bureau.

To the SECRETARY OF THE INTERIOR,
Manila, P. I.



REPORT OF SECRETARY OF COMMERCE AND POLICE.



REPORT OF THE SECRETARY OF COMMERCE AND POLICE.

DEPARTMENT OF COMMERCE AND POLICE,
Manila, November 1, 1907.

GENTLEMEN: I have the honor to make the following report of the operations of the various bureaus of the department of commerce and police for the fiscal year ended June 30, 1907.

COMMERCE.

It has been evident since the beginning of the fiscal year that the commerce of the Philippine Islands has taken a decided turn for the better, and that the tone among the merchants of Manila has been very much more settled and more optimistic. This can not be taken as indicating a condition of real prosperity, but it is a very good sign for the future.

On August 31, 1906, the Commission passed an act abolishing all tonnage dues. The amount which had been collected was not very large, but the fact of the abolition of this tax had a very marked effect on the encouragement of commerce, and many steamers have come to Manila that would otherwise not have done so.

The death of draft animals from the ravages of rinderpest, which breaks out from time to time in one or another of the provinces and sometimes gains considerable headway before the bureau of agriculture is able to reach the scene with its inoculators and stamp it out, still continues to menace the prosperity of some regions, and this, with the bad condition of roads, many of which have been steadily deteriorating owing to lack of funds hitherto available for road maintenance and a consequent failure on the part of the provincial and municipal governments to maintain them, have combined to retard agricultural development in certain regions. On the other hand, this has been compensated by rapid and ready response to improved transportation facilities in other sections, particularly in the valley north of Manila, which might almost be called the "granary of the Philippines," on account of its fertility and the extent of its cultivation.

In my last annual report I gave a résumé of the importations of rice. It is gratifying that this continues to show a steady decrease. It is to be expected that a certain amount of rice will be imported every year, as many prefer the kind of rice that comes from Saigon, particularly Chinamen, who purchase it in preference to the native product.

Importations of rice since 1899, by fiscal years:

1899 -----	₱3, 877, 864	1904 -----	₱23, 097, 628
1900 -----	6, 372, 396	1905 -----	14, 913, 476
1901 -----	10, 981, 916	1906 -----	8, 751, 000
1902 -----	13, 156, 962	1907 -----	7, 324, 986
1903 -----	20, 122, 646		

(In my last annual report errors in two figures managed to slip in, the report of the importation of rice for 1903 having been placed at ₱30,122,646 when the amount should have read ₱20,122,646, and in the report for 1906 having been placed at ₱8,743,964 when the amount should have read ₱8,751,000. The former was a clerical error and the latter was an error which has been corrected in the report of the collector of customs for the fiscal year 1907. Both have been corrected in the present report.)

For the nine fiscal years since American occupation the figures of imports and exports are as follows:

Year.	Imports.	Exports.	Total.
	<i>Pesos.</i>	<i>Pesos.</i>	<i>Pesos.</i>
1899.....	26,233,134	29,290,334	55,513,468
1900.....	41,202,876	39,642,094	80,845,570
1901.....	60,552,400	46,445,096	106,998,096
1902.....	64,058,714	49,089,716	113,148,430
1903.....	65,936,890	66,300,340	132,257,130
1904.....	66,442,502	60,432,254	126,894,756
1905.....	61,758,096	64,711,780	126,469,826
1906.....	51,597,710	63,836,780	115,434,470
1907.....	59,332,280	67,543,084	126,875,314

It will be seen that apart from the importation of rice the growth has been steady, healthy, and uniform. As the importations for railroad construction come in free of duty, they have not been included in the figures submitted. The amount of railroad material imported free of duty for the fiscal year 1907 was ₱879,959.

Comparing the year just ended with the year 1904, if we eliminate the decrease in the importation of rice, which amounts to ₱15,772,642, we find an increase in the imports of all other commodities of ₱8,662,420, or 17.095 per cent.

CHANGES IN THE DEPARTMENT.

On December 10, 1906, by virtue of act No. 1568, the bureau of port works was abolished as a separate bureau and included as a division in the bureau of navigation.

Under authority of the Secretary of War, the United States Signal Corps have begun to transfer the lines and cables heretofore operated under the direction and at the expense of the United States Army to the insular government. This transfer was formally completed and approved by the Secretary of War as of date of October 4, 1907.

By virtue of act No. 1507 the office of supervising railway expert was separated from the bureau of public works, where it had been assigned for administrative reasons, and was made a separate office.

BUREAU OF CONSTABULARY.**COST.**

The total cost of the Philippines Constabulary for the year was ₱3,251,436.40, as against ₱3,744,000 for the fiscal year 1906, a decrease of ₱492,536.60. Of the cost of the constabulary for 1907, ₱105,000 was due to the fact that the force for the most part have been rearmed with the Krag-Jørgensen carbine with bayonet, discarded by the United States Army for their new service rifles.

FORCE.

The force at the beginning of the fiscal year 1907 was 4,932 men and 315 officers, and at the end of same was 4,748 men and 305 officers.

CHANGE IN THE CHIEF.

On April 1, 1907, Brig. Gen. Henry T. Allen, who had served as chief of the constabulary, and later as director of constabulary from the organization of the bureau, received orders from Washington to return to his regiment. He had served with distinction as chief of the constabulary since its organization, and to him is due much of the credit for the fine, efficient, and economical organization which has been established.

His place was taken by Col. Harry H. Bandholtz, then assistant director in the first district. General Bandholtz has also served continuously with the constabulary since April 8, 1903, and has held the most important positions with distinction, including that of acting director, and has proved himself fully competent to take hold of the difficult duties of director.

FRIENDLY RELATIONS.

Throughout the year the feeling toward the constabulary continued to be more friendly, and most of the complaints which at one time were of common occurrence have disappeared.

The director has been very severe in weeding out undesirable officers, and the whole organization now understands the absolute necessity of harmonious relations with local officials, and that to accomplish the purpose of maintenance of order the constabulary have to get the confidence of the people whose interests they are now protecting. During the year instances have occurred where evidence was brought that constabulary soldiers and officers had abused their positions, and in some instances suit was brought in the courts against them and the matter left to the courts to determine. Even when exonerated by the courts of law, they have been sometimes required to leave the service, owing to the fact that the evidence proved that, although not criminally liable, they were not properly fulfilling the duties of constabulary officers.

During the year no scout companies have been required to serve under the insular government.

A compilation of the reports for the past six years during which the constabulary has been in operation shows the following interesting figures:

Firearms captured.....	5,341
Stolen animals recovered.....	5,773
Number of patrols and expeditions.....	40,886
Number of miles covered in such patrols.....	1,121,239
Convictions secured.....	10,596
Desertions from constabulary force.....	250

These figures bear eloquent witness to the usefulness to which the constabulary has been put. In the year 1907 there were but twenty desertions, which, out of a force of 5,000 men, may be taken as negligible.

CONDITION OF ORDER.

The general condition of order throughout the islands is good, and there is to be found no cause for anxiety as to the peaceful condition of the archipelago. People travel from side to side unmolested and unarmed. The only outlaws who remain a menace to public order are Salvador, in the first district, and Otoy, in the third district, who will be mentioned later.

COMMENDATION OF THE SECRETARY OF WAR.

On the occasion of the opening of the Philippine Assembly the Secretary of War took occasion to give high praise to the Philippines Constabulary. The quotation from his speech, with an indorsement of the Governor-General and of the undersigned, follows:

MANILA, October 29, 1907.

MY DEAR GENERAL BANDHOLTZ: It affords me much pleasure to invite your attention to that portion of the speech of the honorable the Secretary of War to the Philippine Assembly, in which he alludes to the constabulary. To what he has said I wish to add that I also am highly pleased with the present efficient manner in which the officers and men of the Philippines Constabulary are performing their duties, and I believe that the constabulary to-day is one of the most valuable aids to the government in these islands.

The remarks of the Secretary of War above referred to were as follows:

"Another agency in the administration of justice has been the constabulary. When I was here something more than two years ago, the complaints against that body were numerous, emphatic, and bitter. I promised, on behalf of the Philippine government and the Washington Administration that close investigations should be made into the complaints and that if there was occasion for reform that reform would be carried out. It gratifies me on my return to the islands now to learn that a change has come, that the complaints against the constabulary have entirely ceased, and that it is now conceded to be discharging with efficiency the function which it was chiefly created to perform, of sympathetically aiding the provincial governors and municipal authorities of the islands in maintaining the peace of each province and each municipality, and that there is a thorough spirit of cooperation between the officers and men of the constabulary and the local authorities."

Very respectfully,

JAMES F. SMITH,
Governor-General.

Brig. Gen. H. H. BANDHOLTZ,
Director of the Philippines Constabulary,
Manila, P. I.
(Through the Secretary of Commerce and Police.)

[First indorsement.]

DEPARTMENT OF COMMERCE AND POLICE,
Manila, November 11, 1907.

Respectfully referred to the director of constabulary.

It is a great gratification to this department, and must be to all members of the constabulary, to read the strong, hearty, and unequivocal indorsement of the Secretary of War, which is approved in no uncertain terms by the Governor-General.

It is hoped that this will be brought to the notice of all officers in the constabulary service, as it will tend to give them a much more settled feeling to know that they have the confidence of the highest authorities and that the usefulness and necessity of the organization of which they are members has been set forth in no uncertain terms in so public an utterance as the address of the Secretary of War in opening the Philippine Assembly.

The fact that complaints were registered against the constabulary in the past two or three years does not necessarily mean that the constabulary were failing to perform their functions before, and the undersigned is sure that the Secretary of War would not wish to be so interpreted, but it did mean that there was room for able, intelligent, and progressive management to end the uncomfortable situation and put the constabulary where they now stand.

The undersigned, therefore, in indorsing all that is said by the Secretary of War and the Governor-General, as his personal belief wishes to extend to the director of constabulary and the corps of efficient and capable officers under him his congratulations on bringing about this condition of affairs.

W. CAMERON FORBES.
Secretary of Commerce and Police.

USE OF KRAG-JÖRGENSEN RIFLES.

Formerly the constabulary were armed with Springfield rifles, which carried but one cartridge, having no magazine and no bayonet. Several disasters have occurred to the constabulary owing to the fact that when rushed at close quarters by superior numbers lying in wait in the dense vegetation they have been able to reach the soldiers who were practically unarmed after one shot. In this way a number of reverses have occurred at the beginning of the trouble, which has resulted in encouragement to the ladrones, the capture of arms by them, and with the prestige of these successes they have induced the ignorant peasantry to espouse their cause and become lawbreakers. The constabulary are now armed with the Krag-Jörgensen rifle of the type recently discarded by the Army. They can be fired six times without reloading, and with the bayonet are adequate protection against encounters with fanatics at close quarters. This makes of the constabulary a much more efficient peace organization.

FIRST DISTRICT.

In the first district, the provinces immediately surrounding Manila, the practical extinction of the outlaw bands by the surrender, noted in my last report, of Montalan, Sakay, Villafuerte, Natividad, and de Vega, has cleared the atmosphere and made the remaining task comparatively easy. The only disturbing element now at large in Luzon is a certain religious fanatic who is at the head of the "Santa Iglesia" or "Holy Church," lives in the swamps and mountains between Nueva Ecija and Tarlac, and is protected by the barrio people, probably on account of belief in his supernatural powers. As he desists from bloodthirsty outrages and makes his levies more by playing upon the credulity of his fellow-countrymen than by threatening torture or

ruin, his presence is not so disturbing as the outlaws south of Manila, recently captured. It is believed that it is only a matter of time, as it has proved in every other place, until these disturbing elements will be removed.

SECOND DISTRICT.

The second district has remained in continued good order, with one small attempted outbreak, due to a semireligious organization which had apparently been kept alive from the old insurrection. The foolish talk of war with Japan caused the leaders and a few members of this organization to begin a movement which received slight local support in a few towns; but the able, active, and progressive governor of the province, Mr. Quezon, took the field in person, dismissed the officials of the town of Atimonan, who had connived at this movement, and assisted the constabulary in breaking up this thing before it had time to gather headway. Col. J. G. Harbord, the district director, was slightly wounded with a bolo in an encounter with the band, an event which he was too modest to notice in his official report.

The island of Samar, which is rapidly approaching an entirely peaceful condition, was added to the second district during the year. The headquarters of this district has been moved to Albay, which is more nearly central to the new distribution of responsibilities. There are outstanding a few scattering pulahanes with a bare score of guns. The depredations have ceased, and the people of the affected regions have all returned to agriculture.

THIRD DISTRICT.

The third district, which includes Leyte, is now in an entirely peaceful condition. The last outlaw known to be at large in Leyte has now been reported captured, and there are no guns known to be out. Complete peace now prevails.

In Cebu, under the wise and aggressive administration of Governor Sergio Osmeña, every effort was made to end the condition of lawlessness which had prevailed for many years in the mountain sections of the island, and the last outlaw came in and surrendered.

In Occidental Negros, Papa Isio, who for so many years terrorized the island, was brought to surrender, which practically breaks up the main element of lawlessness of that island. There are still a few guns outstanding and some few men, who wish to live by depredation rather than by toil.

In the island of Panay the district director reports that conditions are not so good. In the mountains there are several bands who make carabao stealing a business, and as yet the constabulary have been unable to break them up. The continued work, however, of the constabulary is having its effect, and it is fair to say that throughout the third district there is more orderliness than ever before.

FOURTH DISTRICT.

In the fourth district the favorable conditions continue. In the past year several new subprovinces have been created, usually with American governors, to look out for the interests of the non-Christian tribes scattered throughout that country. These subprovinces

are assisting materially in maintaining the orderliness of these people, whose disorders have usually been confined to local feuds, and one or two new posts of constabulary have been established to assist in this important and beneficial work.

FIFTH DISTRICT.

In the fifth district the constabulary are assuming more and more the functions of maintenance or order. The district director reports to the civil governor of the Moro Province, who is also the general commanding the United States Army for that district. The constabulary are being given a greater and greater proportion of the peace duties, and have made an unusually creditable record.

For further information in regard to the bureau of constabulary and its operations for the fiscal year, attention is respectfully called to the report of the director of constabulary, hereto attached and marked "Appendix A."

RAILROADS.

The position of supervising railway expert was created, at a salary of ₱24,000 per year, by virtue of act No. 1507, passed June 29, 1906. Mr. F. A. Molitor took the position, but resigned on March 31, 1907, and Mr. L. F. Goodale arrived shortly after to take his place, and commenced his duties on April 16, 1907.

MANILA RAILROAD COMPANY.

The concession to the Manila Railroad Company was formally accepted on August 28, 1906. A waiver and release of all claims arising under the operations of the old companies was necessary before the old concession could be declared to be terminated. These waivers were submitted to the Secretary of War on February 25, 1907, were returned to London for completion, and were finally accepted on April 24, 1907, upon which date the old charters went out of effect and the provisions of act No. 1510 became effective for the old lines of the Manila Railroad Company and its branches.

During the year work on the new system has been pushed with remarkable energy and activity. In Luzon, on June 30, 1907, 340 kilometers (211 miles) of surveys had been completed, 313 kilometers (194 miles) submitted for approval and approved by the Governor-General, 128 kilometers (79.5 miles) of grading done, 38 kilometers (23.4 miles) of track laid, and 26 kilometers (16.1 miles) of new road certified to be open for operation. As the company had until September 7, 1907, to complete its surveys, and two years thereafter in which to complete its first 150 miles, it can be readily seen that the Manila Railroad Company is pushing its construction far in advance of the requirements of the franchise.

The work done up to the date of this report includes the construction of a line from Dagupan to Camp One, approaching completion; construction of the San Fernando-Florida Blanca branch, one-half completed; Dao-San Pedro-Magalang line, completed and in operation; extension of the road to within 9 kilometers (5.6 miles) of Antipolo; construction of terminals on the Pasig River at the point where the road crosses from the Santa Mesa region to the Paco dis-

trict; preliminary arrangement of location of terminals in the city of Manila; construction of grading from Manila as far as Cavite Viejo and from Manila to Calamba on the Batangas line. Surveys have been in progress on the Albay branch, but the work of construction has not been begun.

The location provided under the law for railroad lines in the provinces of Albay, Ambos Camarines, and southern Luzon was found to be impracticable, as the line from Ligao to Tabaco involves too expensive construction. Accordingly the railroad company has requested and obtained a change of concession, eliminating the expensive part of that line and making connection of the main line with Tabaco from Legaspi. The rich hemp regions adjoining Tabaco and Ligao are to be reached by short branches.

The port of Pasacao was proved by investigation of engineers to be unsuitable for a terminus and the construction of a line to that port has been abandoned. The railroad company contracted to extend 7 miles to the north from Nueva Caceres toward the Gulf of Ragay, in which several good ports are to be found, one of which will undoubtedly be reached by the proposed railroad line. This brings the northern terminus of the Albay line much nearer Manila and renders it morally certain that the interests of the railroad company to make the connection will be so great as to justify the belief that the connection between the southern end of the Manila lines and the northern end of the Albay lines is a certainty in the not too distant future.

The Commission has enacted a law authorizing the Governor-General to advertise for bids for the construction of a line to Baguio and to execute a concessionary contract upon terms that should attract bidders.

Investigation goes to show that electric traction can be made to operate successfully on the present roadbed, which, however, would involve a very considerable expense. It is believed that the presence of a large army post at Baguio would justify this expense, and the establishment of such a post has been recommended by men highest in authority here and in the War Department. Indications are that the construction of a line to Baguio will soon be undertaken.

Gross earnings of the Manila Railway Company, 1893-1906.

1893	-----	₱500, 000	1900	-----	₱725, 000
1894	-----	550, 000	1901	-----	1, 300, 000
1895	-----	600, 000	1902	-----	1, 200, 000
1896	-----	600, 000	1903	-----	1, 575, 000
1897	-----	725, 000	1904	-----	1, 476, 000
1898	-----	775, 000	1905	-----	1, 916, 000
1899	-----	175, 000	1906	-----	2, 038, 000

PHILIPPINE RAILWAY COMPANY.

In the Visayan Islands the Philippine Railway Company has shown commendable energy in pushing construction to early completion. It was found that were the government to wait for final plans before allowing the railway company to begin construction that it would be impossible for the company to build its lines in time to comply with the terms of the concession. This was particularly so in regard to orders for rails, engines, structural steel for bridges, etc.,

from the United States, to secure which it is necessary to send in the orders long before the time for expected delivery. This led to the system of preliminary approval, by which, on the recommendation of the supervising railway expert and this department, the Governor-General authorizes the railway company to order a certain standard of articles previous to the submission of final plans as provided under the terms of the concession. Preliminary approval was also given to the railway company to secure terminals in Cebu and Iloilo.

At the end of the fiscal year the company had completed in Cebu 45 kilometers (28 miles) of grading, 152.8 kilometers (95 miles) had been surveyed, and the location of 96.7 kilometers (60.1 miles) had been approved. In the island of Panay 160.9 kilometers (100 miles) have been surveyed, 28.97 kilometers (18 miles) have been graded, and 71.93 kilometers (44.7 miles) have been approved. In Negros 96.5 kilometers (60 miles) have been surveyed.

The Philippine Railway Company has estimated that part of the line which they are under contract to construct in northern Negros will not pay a sufficient profit to justify its construction, and it has requested relief from the contract to build such section of the line. The abandonment of this section will leave them without any harbor terminal at any point in the island. It is proposed to meet this objection by the construction of a long pier to the open roadstead nearest to Iloilo, situated at Bacolod, from which they will have ferry connection with Iloilo. The government is ready to relieve the company from the necessity of completing this northern Negros line, in so far as can be done by executive action and without modification of the franchise by act of the legislature, but wishes, if possible, to secure a contract from the railway company to build an equivalent amount of railroad to reach some port for which no contract has as yet been signed. It is possible that a line from near Bacolod across the island of Negros to some point on the east coast, perhaps near San Carlos, where there is a fair port, can be constructed at reasonable cost and with sufficient probability of profit to justify its construction. The government believes it for the interest of the islands that the railway people should be satisfied with their investment, and to that end is not inclined to press the construction of lines which careful study has shown will probably be unprofitable and will be a drag on the rest of the system. It is, however, of the utmost importance that the rails on each island should reach some deep-water harbor.

The representatives of the railway company and of the government have been disappointed to find that the first cost of the road will exceed the original rough estimates, and is likely to cost somewhere from ₱55,000 to ₱68,000 per kilometer (\$45,000 to \$55,000 per mile). It has been necessary for the government, in view of the increased liability which this will make on the guaranty fund, to exercise most careful supervision and to make a most thorough inspection of the accounts so as to be able to certify that the money thus spent has been expended wholly for the benefit of road construction. This inspection has shown that the money has so far been expended for the purposes necessary for the economical operation of the road, and the proportion of expenditures which up to date has not been allowed has been comparatively small.

MANILA ELECTRIC RAILROAD AND LIGHT COMPANY.

On January 30, 1906, under act No. 1446, Charles M. Swift was granted a franchise for an electric line from the existing lines in Manila to Pasig. Later this franchise was transferred by Mr. Swift to the Suburban Railways Company, a subsidiary corporation of the Manila Electric Railroad and Light Company.

The above franchises by act No. 1589, of February 1, 1907, was extended to include a branch to Taguig and the Laguna de Bay.

The operation of the branch of the Suburban Railways Company to Fort McKinley was commenced on April 18, 1907. The bridge across the Pasig for the Pasig branch is in process of construction.

The main line of the Manila Electric Railroad and Light Company has now been in operation for a period of a little over a year and has proved eminently successful. The cars are run by Filipino conductors and motormen, the service is steady and satisfactory, and the company prosperous.

PANIQUEI AND CAMILING RAILWAY.

This small railway, which received its franchise by act No. 1448, passed February 1, 1906, had completed up to June 30, 1907, about 19 kilometers (11.8 miles) of grading, laid 17.7 kilometers (11 miles) of track, and completed 20 kilometers (12.4 miles) of surveys. This railway has been built with local capital and will be operated with the assistance of the Manila Railroad Company, they to supply small engines for traction and some of their cars for the use of the branch company. Much creditable work has been done on embankments and grading. The rails used are 11.3 kilograms (25 pounds).

The question of the advisability of granting franchises to construct steam roads on public highways is one of doubtful merit. There is no room in the ordinary country road for a team and train to pass safely. It is believed that, while transportation is deemed to be the most crying need of the country, roads operated by steam traction should be compelled to get their own right of way, leaving the highways for their legitimate and original uses.

For further information and details attention is invited to the report of the supervising railway expert, hereto attached and marked "Appendix B."

BUREAU OF PUBLIC WORKS.

The bureau of public works has completed its first full year in the new form which was given it by the reorganization act, No. 1407. The general policy under the new system has been to centralize all the constructing work in the bureau of public works with certain exceptions, such as construction of light-houses and port works now under the bureau of navigation, the work done by the city engineer's office in the city of Manila, and the sewer and water works of the city of Manila, now handled by a special officer.

The government has undertaken the policy of letting contracts for most of its work, the director of public works preparing the plans and specifications for the engineering work and the consulting architect the plans and specifications for all architectural work, such plans being turned over to the bureau of public works, which makes the con-

tract and oversees the work. The system of district engineers adopted at the time of the reorganization of the government abolished the position of provincial supervisor and placed the supervision of provincial construction under the bureau of public works. The position of the district engineer as regards municipalities, however, is merely advisory. The following table shows the economy of this change:

	Value of work accomplished.	Cost of superintendence.	Per cent cost of value.
	<i>Pesos.</i>	<i>Pesos.</i>	
Old system, 1905.....	824,148	161,690	19.6
New system, 1906.....	885,502	121,767	14.0

The present regulations provide that the actual cost of supervision up to 10 per cent of the total cost of the work shall be charged against provinces and municipalities. Of the total cost of supervision under the new system during the year 1906, only ₱36,475 can be collected from provinces and municipalities, leaving ₱85,292 to be borne by the insular government, hence the average cost for superintendence to the provinces and municipalities was only 4 per cent of the total cost of the work.

ROADS.

On July 13, 1906, act No. 1511, the so-called road law, was passed, authorizing provinces and municipalities to compel every person liable to the payment of a cedula to work for five days in each year on the roads or pay a commutation in lieu thereof. The hostility of the people of the Philippine Islands to this measure soon became very pronounced. Although assurances had been received from local governors that the law would be accepted, the conventions of municipal officials in the provinces of La Laguna, Surigao, Ambos Camarines, Albay, and Bohol in each case refused to accept the law by such an overwhelming majority that it was soon evident that the people were not ready to adopt this means of bettering their roads.

The absolute necessity for good roads, however, has grown more and more apparent. Roads constructed or repaired by the insular government and turned over to the provinces and municipalities to maintain within two or three years have become absolutely impassable. The first two or three years after the construction of the road are often the most important years from the point of view of maintenance. The soft places in the road develop, the rock sinks in spots, and soon the continued traffic cuts through the shell of road material, and the puddle made by the depression of the road surface soon becomes a sink pit, in which the road material for the whole width of the road sinks and is lost. A little work at the outset filling up the depressions as they appear, keeping the surface of the road crowned, making sure that the ditches and culverts are kept clear and that the water does not go running down the road in ruts instead of off to the side, as it should from a properly crowned surface, would make the difference between having a good road and having none at all.

In my last two annual reports I called attention to the fact that much of the construction which had been done by the Americans has been allowed to deteriorate. This has continued until at the pres-

ent time, with few exceptions, the condition of the roads throughout the archipelago is lamentable and is growing worse from day to day. What were good and passable roads three years ago are now quagmires in the rainy season, and throughout the past year it has become evident that to avoid a paralysis of industry in many districts a drastic change of policy is needed in regard to road construction and maintenance. Failure of the road law brought the Commission face to face with this serious problem, and every opportunity which the secretary of this department has had to travel in the provinces has been utilized in visiting provincial and municipal officials, traveling over the roads, and urging and exhorting them to establish the proper system of continuing road maintenance. The main difficulty has been the lack of resources. In many cases local officials were willing, but had not the authority of law to obtain the funds necessary for this important work. In the Tropics the problem of road maintenance is doubly hard. The luxuriance of vegetation is such that, unless prevented, a whole road is likely to be obliterated in the course of six months by encroaching vegetation. The rainfall is often so torrential in its nature that it is very difficult to figure on the maximum amount of water to be drained. The path of an unusual typhoon or a combination of two typhoons at the same time may cause a down-pour of rain amounting almost to a cloudburst at some unexpected point, with resultant loss of road or bridge or whatever construction lies in the way.

The failure of the provinces to accept the provisions of the road law (act No. 1511) necessitated new measures. The first measure for the relief of this situation was taken by the Commission in Baguio in the passage of act No. 1617, which provided that any province, with the approval of the Governor-General, could declare certain specified roads toll roads for a period not to exceed five years. In this way the cost of maintenance of a road could be made to become a direct charge on the people who used it most. But one province has availed itself of this authority, namely, La Laguna, where the San Pablo Bay road was made a toll road to provide funds for the maintenance, which it is estimated will cost ₱15,000 a year.

Objection had been raised in some of the provinces to the road law because there was no provision for its repeal or suspension by either provinces or municipalities once it was accepted. To meet this objection act No. 1653 was enacted, which authorized provinces to accept the provisions of the road law for a definite period of time, and in addition gave a similar power to municipalities.

The real remedy, however, of the situation was found in the passage of act No. 1652, which authorized the provincial board of any province to double the cedula tax for that province. This differed from the old road law in that the money was to be used under the direction of the provincial board and in their discretion, and not under the direction of the presidents of the municipalities. In case of failure to pay, the value of the money could be worked out on the road at a given price. Provinces were not quick to avail themselves of the opportunity thus offered to them, and by the time the annual appropriation bill came around the attention of the Commission had been thoroughly called to the absolute necessity of some definite and general action in regard to the establishment and continuance of an

effective system of road construction and maintenance. At the same time the Commission desired to interfere as little as possible in the autonomy of the provinces and municipalities. The provinces during the year have been made practically autonomous, having now two-thirds of the provincial board elected by the people instead of two-thirds being appointed by the Governor-General. It makes the difference in provincial boards of which two-thirds are Filipinos instead of provincial boards of which two-thirds were usually Americans.

Although desirous of leaving the matter of road maintenance as far as possible in the hands of local officials, it was obviously necessary to find some way of inducing the provinces to accept the double cedula tax and to get a pledge that all roads constructed would be maintained without possibility of deterioration. The department has made a careful study of the problems involved and has reached the conclusion that the most practical way of solving the matter is by a system of insular aid, given on condition of a proper maintenance system being established, under the penalty, in case any roads are found to be deteriorating, of the money for the upkeep of the same being turned over to the director of public works and the road maintained under the direction of the insular government. The administrative power of the Governor-General to remove officials neglecting their duty is also a very powerful agency in compelling attention to this important detail. The system of maintenance determined upon is generally known as the "caminero" system, which provides for the division of the roads into sections of such length as can be cared for properly by one man continuously at work. This road man, or caminero, is charged with the duty of working continually upon his section, of keeping back encroaching vegetation, and of keeping the culverts clear and the road properly crowned, using approved material only for the filling of depressions or ruts; and it is hoped that provision will be made to grant police authority to the caminero in so far as matters pertaining to the maintenance of roads and bridges and keeping them open for use is concerned. He should have the power to prevent the use of roads by narrow-tired carts, the obstruction of the road by vehicles or other structures or articles, the stealing of planks or bolts from bridges and of rock or gravel from other parts of the road, and should notify central authorities instantly in case of any occurrence resulting in damage to the road to an extent beyond his powers to remedy within a reasonable and prescribed period of time. The system also involves the deposit of road material approved by competent authority in places designated for the same alongside the road at short distances, which are to be kept filled for use by the caminero in his work, and it should be unlawful to put any other kind of material on the road. This will put an end to the very pernicious system now very prevalent of maintaining the road with vegetable matter or mud taken from the roadside. It is hoped that each province will have road gangs in addition to the camineros, and rock crushers, steam rollers, traction engines, and cars, in order to have adequate and economical machinery with which to carry out the details of road construction and maintenance.

To accomplish these results the Commission determined to make a very considerable appropriation for roads, conditional upon the acceptance of the double cedula tax, and in furtherance of this plan act

No. 1695 was passed, which authorizes 10 per cent of the internal-revenue tax to be divided proportionately to population among those provinces which accepted the double cedula tax. The money which should go to those provinces which do not accept the double cedula tax will be added to the fund of those provinces which do accept it. In addition to this the Commission made an appropriation of ₱1,321,225 for roads and bridges, ₱821,225 of which was for specific road projects, and ₱500,000 to be allotted in the discretion of the secretary of commerce and police, the money for specific road projects to be available only for those provinces which entered into a contract for continuing road maintenance under penalty, in case of failure, of having to pay over a certain amount of money to the insular government and having the work done by the bureau of public works. The ₱500,000 to be allotted by the secretary of commerce and police has been proportioned among those provinces which do not receive specific amounts, and is allotted on condition only that the provinces enter into an agreement for the maintenance of all first-class roads in the province, said first-class roads to be designated by the director of public works, and that they agree to appropriate a given amount each year for each section and to maintain all roads in good order with the caminero system, under penalty, as before indicated, that the director of public works may take over the maintenance in case of failure. It is hoped that the policy will be established here that no officer can hold his position if he fails to maintain a road which has been intrusted to his care with sufficient funds to properly perform the work; that the criterion will be the condition of the road; that each section will have the exact condition in which it was left when it was completed noted, and that in case any deterioration is noted one month's notice shall be given to the local official, and if at the end of that time he has not properly fulfilled his duty, as sufficient funds should be appropriated for each section of the road to leave ample margin for contingencies, the burden of proof will be on the delinquent official to prove that the deterioration of the road was due to extraordinary and unusual causes; that the Governor-General will prescribe the strictest kind of procedure and make the official's tenure of office dependent upon his maintenance of this absolutely vital requirement for the life and prosperity of the people under his care.

The result of the inducements offered to the provinces to accept the double cedula tax was remarkable. All but four of the provinces have had the good sense, wisdom, and courage to accept the law doubling the cedula tax, and thus enabled themselves to participate in the ₱2,000,000 of insular money made available for road purposes by acts Nos. 1688 and 1695. The increased cedula tax in those provinces where it has been doubled will amount to a grand total of about ₱1,500,000 a year, which, with the new insular aid and the old road and bridge funds, should these measures continue in effect, each year will give an annual amount for road building of rising ₱4,000,000, or considerably more than five times the largest amount available for the expenditure on roads in previous years.

The four provinces that have not had the wisdom and foresight to avail themselves of the privileges of this road construction are Bulacan, Cavite, Tarlac, and Nueva Ecija. It is hoped that these provinces will realize in another year what will inure to the best interests

of their people and will join their sister provinces in the new era of road development.

THE USE OF WIDE-TIRED CART WHEELS.

The law in regard to wide-tired cart wheels has not been pressed to the point that it should have been. The manufacture of such wheels in Bilibid did not meet with as ready a sale or as growing a demand as it should have. The result has been that there has been a very slow disposition of the wheels on hand. Recently, however, with a marked revival of interest in the question of roads, the demand is steadily increasing for the wheels made by convicts. A plan has been adopted in the province of La Laguna, where the provincial officials are particularly active in their efforts to establish a proper system of roads, of offering to carabao owners a wide-tired cart made in Bilibid as payment for a month's work in hauling road material. This is an inducement to the owners of these animals, it helps build the road, and does its part toward bringing in the wide-tired carts, which have a good effect in maintenance.

It is only fair, in passing, to speak of the good work which has been done in certain provinces toward road construction. During the year 276 culverts and 32 bridges of reinforced concrete and 5 bridges of steel have been built.

IRRIGATION.

The value of irrigation is nowhere better shown than in the case of the friar lands recently purchased by the government, where the irrigating plants form a valuable part of the assets of the property in those estates which have them and add marked value to the land. Not only does irrigation increase the crops which can be taken from the soil in good years, but it is also an insurance fund against dry spells during the usual season for crops, such as is occurring at the time of the present writing in some provinces in Luzon, and the Commission has at last taken action in this matter and has appropriated ₱250,000, to be allotted in the discretion of the secretary of commerce and police, for irrigating projects, and ₱57,275 for special projects, most of which are for the development of the friar lands. The water made available by the irrigation system which it is proposed to establish will be leased in such a way as to provide a revenue to the government, which will be used as a reimbursable fund available for further irrigation enterprises. It is believed that with the extension of this system the advantages will become so apparent that the government will continue to add to this fund from year to year, making a minimum annual appropriation of, say, ₱250,000, and in the course of time the development of irrigation works in accordance with this plan should become a very important branch of the government enterprise.

In this connection attention is called to the great productiveness of the province of Pampanga, a province where irrigation works on a large scale are now in operation. The provinces of Tarlac and Pangasinan are capable of similar development, and many places throughout the islands will be found that will respond freely to this expenditure of money.

WELL BORING.

During the year thirteen wells were dug, of an average depth of 53.28 meters, at an average cost of ₱1,537 and with an average delivery of 264.7 liters per minute. Of these thirteen wells, five gave flowing water. The good results of these wells have been such as to justify the Commission in ordering two additional well-boring outfits, one of which was ordered last year, but, through mistake, has not yet been received; the other has been appropriated for this year. The sum of ₱37,000 has been made available for these works, and the Commission, in view of the very great importance of the work and the beneficial results from a sanitary point of view, has determined to charge only the actual cost of the successful wells, the insular government to bear the expense of those which fail to find water. Thus the municipalities are assured that either they will get a supply of water or that they will not have to pay. This was determined upon in order to encourage municipalities in the desire for this very marked improvement. Twenty-seven requests are now on file for artesian wells, and there is no doubt whatever but that the three outfits will be kept continually busy.

PERMANENT CONSTRUCTION.

The policy outlined in the preceding report of the use of the superior qualities of Philippine woods in the construction of all edifices of permanent materials has been rigidly adhered to. A reenforced-concrete building constructed here costs from two to three times the cost of a building of Oregon pine, which is pretty sure to be rotted inside of ten years and on an average within six years. The cement is practically permanent, and with reasonable care and less maintenance expense than the other may be expected to be as good at the end of fifty years as it was when built. Taken on a fifty-year basis, therefore, one sees that the Oregon pine building is an extravagance too great for a poor country.

BENGUET IMPROVEMENTS.

During the fiscal year 1907 the development of Baguio has received a marked impetus. All lots offered for sale have been sold, a new hotel has been constructed, the Hotel Pines largely increased, and visitors seemed to enjoy their visit to Baguio, and the people who avoided the heat of Manila in the new city have shown some enthusiasm. Camp John Hay, the military post in Baguio, has instituted the construction of an admirable system of roads and has completed a careful parking of an important section of their reservation, where also a number of new buildings and places of amusement have been constructed and a number of tents set up for the use of army officers and their families. The Commission appropriated ₱30,000 for the construction of a suitable residence for the Governor-General and established the policy of maintaining such residence for him in Baguio. A section of 10 hectares was laid aside for a park surrounding the Governor-General's residence. The contract was let on December 5, 1906, the house to be ready for occupancy within the ensuing year. The site for a permanent park has been selected and reserved,

and a base-ball field prepared for public use. A country club has been established by private enterprise, and has been provided with golf links, clubhouse, tennis courts, and other opportunities for entertainment.

A number of very beautiful drives and roads have been provided and made available for the use of visitors. The money for the roads came from the sale of lots, and no appropriation of insular money was made during the year for Baguio improvements. These roads are merely cut in the clay, and are therefore very cheaply built and can not be used for heavy traffic during the rainy season. They need to be carefully improved and metaled, as the rainfall at Baguio during the rainy season is excessive and most trying on road construction. One of the most gratifying results of the season has been the interest taken by Filipinos in Baguio. Many of them came up during the year and expressed themselves as being surprised and delighted with the change of climate and were optimistic in regard to its use and future. The Society of Jesus have purchased a site for a sanitarium and observatory of something over 8 hectares, where they are proposing to put up a rest house and sanitarium. The archbishop of Manila has built a private residence on a fine, commanding hill overlooking the canyon of the Bued River, and a number of other private residences have been constructed or are now in course of construction.

BENGUET ROAD.

The Benguet road has stood satisfactorily throughout the year. The process of improvement of the road and of replacing the temporary wooden bridges with stone and cement ones has steadily progressed. The road has been kept continuously open, with the exception of a few periods of a few hours each when it was closed for repairs of a minor nature. The traffic has been very heavy and has taxed the surface and the organization for its maintenance. The caminero system, elsewhere described, has been put in operation here with marked success.

For further information and details attention is invited to the report of the director of public works, attached hereto and marked "Appendix C."

CONSULTING ARCHITECT.

The following general summary indicates clearly the magnitude of the work intrusted to the consulting architect:

1. *Manila*.—The laying out of the park system, treatment of the old walls, and the arrangement of streets, roads, and boulevards in and about the Luneta Extension and the filled-in land (on which it is hoped that soon the construction of warehouses and other business buildings will begin).

2. *Baguio*.—The laying out, parking, and general development of the town site.

3. The preparation of a comprehensive plan for development of other sites and towns (locally known as "Burnhamizing").

4. The preparation of plans for all important public buildings of a public character constructed by the insular, provincial, and municipal governments.

In addition to this government work the consulting architect is authorized by the law creating his position to do work for private parties and to receive remuneration therefor. This was done because many of the most dignified, important, and imposing buildings in the city will be constructed by private parties, and in order to make a city of harmonious lines and architectural beauty the government is wisely affording the opportunity to have them properly and uniformly treated. The most notable of these buildings are the proposed new hotel on one wing of the Luneta Extension, the clubhouses for the Elks and the Army and Navy Club on the other wing, and the terminal railroad station for the Manila Railroad Company.

The consulting architect has constantly adhered to the policy, elsewhere outline, of making all buildings and structures of permanent and durable material. As a result a very considerable proportion of the construction now under way is of reinforced concrete.

The following summary indicates the government work done by the consulting architect during the past year:

Complete working plans prepared for 36 projects, aggregating.....	₱961, 424. 50
Complete plans and specifications in course of preparation for 25 projects, aggregating.....	694, 396. 00
Preliminary plans and estimates submitted for 13 projects, aggregating	1, 538, 000. 00

A total of 74 projects, involving a total of..... 3, 193, 820. 50

For further information and details attention is invited to the report of the consulting architect, attached hereto and marked "Appendix D."

BUREAU OF POSTS.

This important part of the government service now includes the whole government business of transmitting communications by means of posts, telegraph, telephone, and otherwise.

The table appended will show five years' operations of this bureau. In the first two years, 1904 and 1905, and part of 1906, the operation of the telegraph lines was under the control of the constabulary.

Part of the good financial showing which is made is due to the fact that by combining the position of postmaster and telegraph operator marked economy was obtained, although before the change went into effect it is true that the constabulary had the compensating advantage that they could use enlisted men for line inspection and repairs. It is believed, however, that the present good financial showing as given in the appended statement fully justifies the change which was made in 1906.

Originally the telegraph and the telephone service was constructed and operated by the United States Army, at the expense of the United States Government, and as a military necessity. The Commission has hesitated a long time before taking over these lines, as it felt that the demands upon the insular treasury were so great that it could ill afford the heavy additional expense of maintaining unprofitable telegraph lines. The cost, however, to the United States Army was so great for the maintenance of these lines that with the era of economy which has been inaugurated it became evident that many of the telegraph and cable lines would be abandoned as no longer necessary for military purposes if not taken over by the insular government.

Negotiations extending over a period of eighteen months finally culminated in the approval by the Secretary of War of the general plan of transfer arranged between the commanding general of the Philippines division and the secretary of this department, which provides that the Army should have a cable ship in the Philippine Islands for a period of two years from October 4, 1907, the date upon which the transfer was approved by the Secretary of War, the expense of the maintenance of cable, however, to be borne by the insular government, and that the insular government should give to the Army free service for a like period, after which the Army will be upon the same basis exactly in regard to payment for service as the bureaus and offices of the insular government and private individuals, and then the insular government may have to supply its own cable ship. The appraised value of the lines transferred is approximately ₱1,094,391.

The mileage of the insular telephone, telegraph, and cable lines at the close of the fiscal year was 8,105.24 kilometers (5,036.5 miles). Since the close of the fiscal year 1907 there has been transferred from the United States Army 2,948.3 kilometers (1,832 miles) of telegraph and cable lines, so that the total mileage of wires under control of the bureau of posts is now 11,053.54 kilometers (6,868.5 miles).

COST.

Attention is invited to the fact that on January 1, 1906, the bureau of posts ceased giving free service for any kind of transmission, except to the United States Government, in return for free service received from the Army over their lines, and as a result the figures of the past one and one-half years show the real operations of the bureau and give a better idea of the real cost. The figures are quite gratifying, especially in view of the fact that the gross cost of ₱1,388,000 estimated for the fiscal year 1908, for which appropriation has been made, includes the establishment of a rural free-delivery system, which will cost ₱100,000 to operate, the cost of establishing and maintaining the Postal Savings Bank, estimated at ₱60,000 per year, and in addition the new expense incident to taking over the army telegraph and cable lines.

The total cost of operating the bureau of posts for the fiscal year 1907 was ₱1,035,223.13. It is believed that the bureau of posts has been managed in a most thorough, competent, and careful manner, and upon a thorough business basis.

NUMBER OF POST-OFFICES.

At the beginning of the fiscal year 476, and at the end thereof 505 post-offices were in operation.

NEW POSTAGE STAMPS.

The new postage stamps were received from the Bureau of Engraving and Printing in August, 1906, and now the Philippine Islands have a distinctive set of stamps, different from those of the United States.

PERSONNEL.

The personnel of the bureau has increased during the fiscal year from 1,003 at the beginning to 1,091, an increase of 88 employees.

There was a decrease of 13 Americans and an increase of 101 Filipinos, an increase in the percentage of Filipinos from 78 per cent at the beginning of the fiscal year to 81 per cent at the end thereof. The proportion of Filipinos has not been increased more rapidly, because in taking over the telegraph lines it has been impossible to substitute Filipinos for American operators until Filipinos capable of handling the difficult duty of taking messages in English correctly have been educated. These figures, of course, do not include 252 mail carriers and contractors, substantially all Filipinos.

REGISTERED MAIL.

The registration of mail shows the total number of pieces of mail registered during the year to have been 280,044, as opposed to 245,831 registered in the previous year, an increase of 13.9 per cent.

MAIL CONTRACTS.

The acceptance by the Manila Railroad Company of the new concession granted by act No. 1510 and the assumption of the obligation therein contained to construct over 400 miles of new railroad in Luzon terminated the old Spanish concession, which provided for free mail service, and in the future the bureau of posts will have to pay for the transportation of the mails over all railroad lines in the islands.

MONEY ORDERS.

The money-order business continues to steadily increase. The number of offices increased from 60 to 63. The number of money orders issued increased from 94,261 to 98,813, but the amount of the orders issued decreased from \$3,687,126.81 to \$3,229,446.09. The average amount of each money order issued decreased from \$39.10 to \$32.69. It is possible that some of the decrease in money orders is due to the establishment of the postal savings bank, in which money is now deposited at interest which before was held by the post-office without interest for people who bought money orders payable to themselves at Philippine post-offices as a device for getting it kept safely.

POSTAL SAVINGS BANK.

The postal savings bank was first opened in Manila on October 1, 1906. The law provides for three classes, with limitations as to the amounts that can be received at any one time in each class. Following the opening of the Manila office other postal savings bank offices were opened in various cities, of different classes, until at the close of the year 235 had been opened, of which 9 were first, 86 were second, and 140 were third class. At first the Filipinos did not to any great extent avail themselves of the opportunity of depositing a portion of their receipts in the postal savings bank, and the great bulk of the depositors were Americans or other nationalities. As the advantages of this system have been disseminated through means of schools, government bureaus, private agencies, and others, the proportion of Filipinos is continually increasing, and gives very

good promise that the Filipinos will learn to trust their money to the care of the government and welcome the opportunity.

The accounts opened up to the close of the fiscal year number 2,676, of which 347 were closed, leaving 2,329 still open. The deposits reached the total sum of ₱786,361.03, an average of ₱108.21. Withdrawals reached the total amount of ₱280,499.21, leaving a net deposit of ₱509,463.34 at the end of the fiscal year, or the first nine months of the operation of the postal savings bank, but by no means the first nine months of operation of the average number of offices, the smaller ones having been opened from time to time during the year, so that many had not been opened more than a month or two at the time these figures were taken.

At the close of the fiscal year depositors were as follows: Americans, 1,616, or 60.4 per cent; Filipinos, 944, or 35.3 per cent; others, scattered between Europeans, Asiatics, and societies.

In the report of the bureau of posts other methods of classification will be found which will be of interest. Of the 2,329 accounts standing at the close of the fiscal year, 50 are standing open with no balance, and 1,155 will be found to be of less than ₱50 in amount. Seven hundred and twenty-two of these are accounts of Filipinos.

POSTAL SAVINGS BANK STAMPS.

The device of issuing postal savings bank stamps has met with some response. They were not put on sale until February of this year, and it is believed they will be greatly appreciated by people of small means and school children. No original deposits of less than ₱1 are received, nor can a book be issued for less than that amount. The stamps are simply a method by which small amounts can be deposited without the expense of issuing a book, figuring interest, and opening an account. Each post-office at which a postal savings bank has been opened has for sale postal savings bank stamps of the denominations of 5, 10, and 20 centavos, which can be sold and accounted for as are ordinary postage stamps. A child purchasing receives a card upon which to stick the stamps, with spaces for enough stamps of the denominations selected to fill out the amount of ₱1, and upon filling in all the blank spaces of his card with appropriate stamps, deposits his card, which is received as cash by the postmaster and a postal savings bank book is issued to the amount of the deposit and an account is opened in the office with the owner of the book. An effort is being made to advertise the use of these stamps through schools, hoping in this way to reach the people.

INVESTMENT OF POSTAL SAVINGS-BANK FUNDS.

On the whole, the reception accorded the postal savings bank has been gratifying and gives good promise. The investment of the funds is in the hands of a postal savings bank investment board, which carries a certain amount of the funds on deposit, and has limited power of investment. The law provides that 25 per cent of the money held on deposit may be loaned on first-class real estate, under limitations carefully drawn to protect the depositors, and 10 per cent on agricultural lands under still more rigid limitations.

Operation of the bureau of posts, fiscal years 1904-1908.

	1904.	1905.	1906.	1907.	1908.
	<i>Pesos.</i>	<i>Pesos.</i>	<i>Pesos.</i>	<i>Pesos.</i>	<i>Pesos.</i>
Expenditures.....	902,048.71	936,647.25	883,268.21	1,145,575.33	*1,310,000.00
Receipts.....	384,498.89	398,080.95	545,654.74	583,919.30	*700,000.00
Net cost.....	517,555.32	543,566.30	347,613.47	561,656.03	*610,000.00

* Estimated.

* Appropriated.

These figures have been prepared to show the comparison between the different years' operations of the post and telegraph service. They will not agree with the figures of the bureau of posts shown in previous reports, because the telegraph service was at that time in whole or in part under other bureaus.

For further information and details, attention is invited to the report of the director of posts, hereto attached and marked "Appendix E."

BUREAU OF NAVIGATION.

The bureau of navigation has had an eventful and progressive year. Attention is called to the following table of comparative expenditures and receipts operating for a period of four years:

Division of vessels.

Year.	Expenditures.	Receipts.	Net expenditures.
	<i>Pesos.</i>	<i>Pesos.</i>	<i>Pesos.</i>
1904.....	1,398,392.60	-----	1,398,392.60
1905.....	1,159,342.23	-----	1,159,342.23
1906.....	1,059,770.62	192,091.85	876,678.77
1907.....	866,479.85	450,295.48	416,184.37

This bureau, perhaps more than any other, has demonstrated the beneficial results, from an economic point of view, of having each bureau pay for the services it receives from the other bureaus of the government, and at the same time of having all the steamers of the government under one administrative head.

The government is now operating eight less steamers and six more launches than in the fiscal year 1905, before the reorganization went into effect. Of these, the coast-guard cutters were operated at an expense of some ₱50,000 per year each, and at the same time were operating to the direct disadvantage of the commercial lines. Of the nine steamers operating at the present writing, three are operating on regular routes and two are light-house tenders. The steamers operating on regular routes are taking the business of the public, but are so operated that they do not come into competition with commercial vessels. The result of the operation of the division of vessels shows profitable and advantageous use of all vessels now kept in commission, and by the constant supervision of the condition of the vessels a high standard of efficiency is continually being kept up.

The operation of steamers on contract routes has proved a very decided success. Merchants find that they now can get regular service at known rates, which can not be changed without previous approval by the government. They know beforehand the exact ports

of call which are to be made by each steamer and do not have their goods unnecessarily refused at the ship's side. People can calculate in making their journeys what time the steamers will arrive to take them and know to what ports they can go and what the connections will be. This has a tendency to increase passenger traffic, and this department has been informed by the shipping people that the result has gratified them by a very marked increase in the business which the regular schedule has brought about.

UNION TICKET AND INFORMATION COMPANY.

The office of the superintendent of interisland transportation has been moved into the Union Ticket and Information Office, situated in the building previously known as the "Office of the Captain of the Port." Here are combined ticket offices for most steamship lines, cab stands, telephone office, and room for visiting captains. There are waiting rooms for men and for ladies, and this building, it is believed, will fill a long-felt want for the further development of the port of Manila. It is hoped that this company will take more commodious quarters and have a division for the care and encouragement of tourists, with a room for custom-house officials, where the baggage of first-class passengers can be examined. At present it is not clear exactly where the new site should be, whether on the south bank of the Pasig River or on the filled-in land contiguous to the proposed new hotel.

DIVISION OF VESSELS.

As compared with the preceding year, seagoing vessels visited during the year 4,370 ports, a decrease of 869; carried 14,915 passengers, a decrease of 7,364, and 6,976 tons of freight, a decrease of 171 tons; and steamed 290,000 miles, a decrease of 100,555 miles.

During the year ₱235 in fines were charged against contract steamers.

LIGHT-HOUSE DIVISION.

At the beginning of the fiscal year 1907 there were 105 lights; at the close 117, an increase of 12 lights during the year. These lights may be grouped as follows:

Flashing lights.....	28
Occulting lights.....	9
Fixed lights.....	3
Port lights.....	28
Lens lanterns.....	47
Electric arc lights.....	2
Total.....	117

There are now in place 109 buoys and beacons.

It is believed that the navigated coast line of the Philippine Islands is now reasonably well lighted.

DIVISION OF PORT WORKS.

The Luneta Extension was completed June 3, 1907, and will shortly be turned over to the city of Manila for maintenance. The contract for the extension of the east breakwater was completed May 17, 1907.

The construction of new wharves has been slowly progressing. The original plans did not provide for abutments, and the plans sug-

gested involved the construction of an expensive new sea wall, calling for a sum of money not readily available from the insular treasury. The then director of port works was asked to prepare plans for abutments only, leaving the sea wall for later development, and he proposed as an economical measure abutments similar to those which were put in use for the wharf recently completed for the Army, and which at that time were giving good satisfaction, but which since have settled considerably. The contract for the two abutments for the new Manila wharves, at a cost of ₱15,000, was let January 12, 1907. On May 13, 1907, after ₱3,492 of the money appropriated had been expended, the concrete wall for the first of these abutments settled and proved that the plan was not satisfactory; wherefore the contracts were canceled. The then chief of the division of port works prepared plans for new abutments at a cost of ₱375,000, but this department was not satisfied with the necessity for the magnitude of this increase and a committee of expert engineers was convened, who, after consultation with the contractors and the director of navigation, prepared new plans for abutments, for which contracts amounting to ₱113,041.54 were let on the 22d day of October, 1907.

Wharf "B" should be completed and ready for use in March and wharf "A" in August, 1908.

IMPROVEMENT OF THE PORT OF CEBU.

The improvement of the port of Cebu has been progressing slowly, the contractors not being able to complete their work on time.

IMPROVEMENT OF THE PORT OF ILOILO.

The port of Iloilo has been completed.

During the year 6 ports were surveyed, and preliminary examinations of 20 other ports made. Since June 30, 1907, 5 ports have been surveyed.

PHILIPPINE COAL SUPPLY.

During the year the coast-guard cutters plying in the neighborhood of Albay have purchased their coal in Batan. It is necessary to change the grate in these steamers in order to make economical use of this coal, but the result has been uniformly satisfactory and a very great saving has been made.

For further information and details attention is invited to the report of the director of navigation, attached hereto and marked "Appendix F."

BUREAU OF COAST SURVEYS.

At the beginning of the fiscal year it is estimated that 1,645 statute miles, or 2,647.4 kilometers, of the general total of 11,511 statute miles, or 18,525 kilometers, the equivalent of 14.3 per cent of the coast line of the islands had been surveyed for charting. During the year 828 statute miles were completed, as against 358 statute miles for 1905 and 431 statute miles for 1906, making a total at the close of the fiscal year, exclusive of Spanish and British work, of 2,474 statute miles, or 3,983 kilometers, the equivalent, in other words, of 21.5 per cent of the total general coast line of the Philippine Islands.

The cost of the work for the past three years has been ₱380,850 for 1905, ₱518,054 for 1906, and ₱544,762 for 1907, or ₱892.80 per mile of coast line completed.

The director of coast surveys explains part of the increase in survey for the past year by the fact that a considerable portion of the coast line surveyed lay in deep water, where the absence of obstructions made it unnecessary to run the lines so close as would be the case where the water is shallow and obstructions appear near the surface.

The director reports good progress in the preparation and issue of charts, for the detail of which attention is called to his report.

CENTRAL GEOGRAPHICAL OFFICE.

At the close of the fiscal year 1907 the Secretary of the Interior called the attention of the officers of the various bureaus to the fact that no systematic compilation was made of the surveys and material gathered by the different bureaus, and thus available knowledge acquired by the army and naval authorities and the different bureaus was not being compiled in such a way as to make it useful and available for other bureaus and departments, whether of insular or United States surveys, and for the compilation of correct maps. The Commission took appropriate action and have provided that an office be established in the bureau of coast surveys which should be the official recipient of all information gathered by all bureaus in regard to the geography of the islands. This new division of the coast survey is now under organization and should remedy the defect.

For further information and details attention is invited to the report of the bureau of coast surveys, hereto attached and marked "Appendix G."

CORPORATIONS.

The corporation law (act No. 1459), which took effect April 1, 1906, provides (in sections 68 to 73) that all foreign corporations shall be licensed by the chief of the division of archives, patents, copyrights, and trade-marks, and that the order for such license in case of all corporations other than banking ones shall be issued by the secretary of commerce and police if satisfied of the solvency and fair dealing of the applying corporation. As originally drawn the act gave foreign corporations until September 1, 1906, to secure this license, but subsequent amendments extended the time to August 1, 1907.

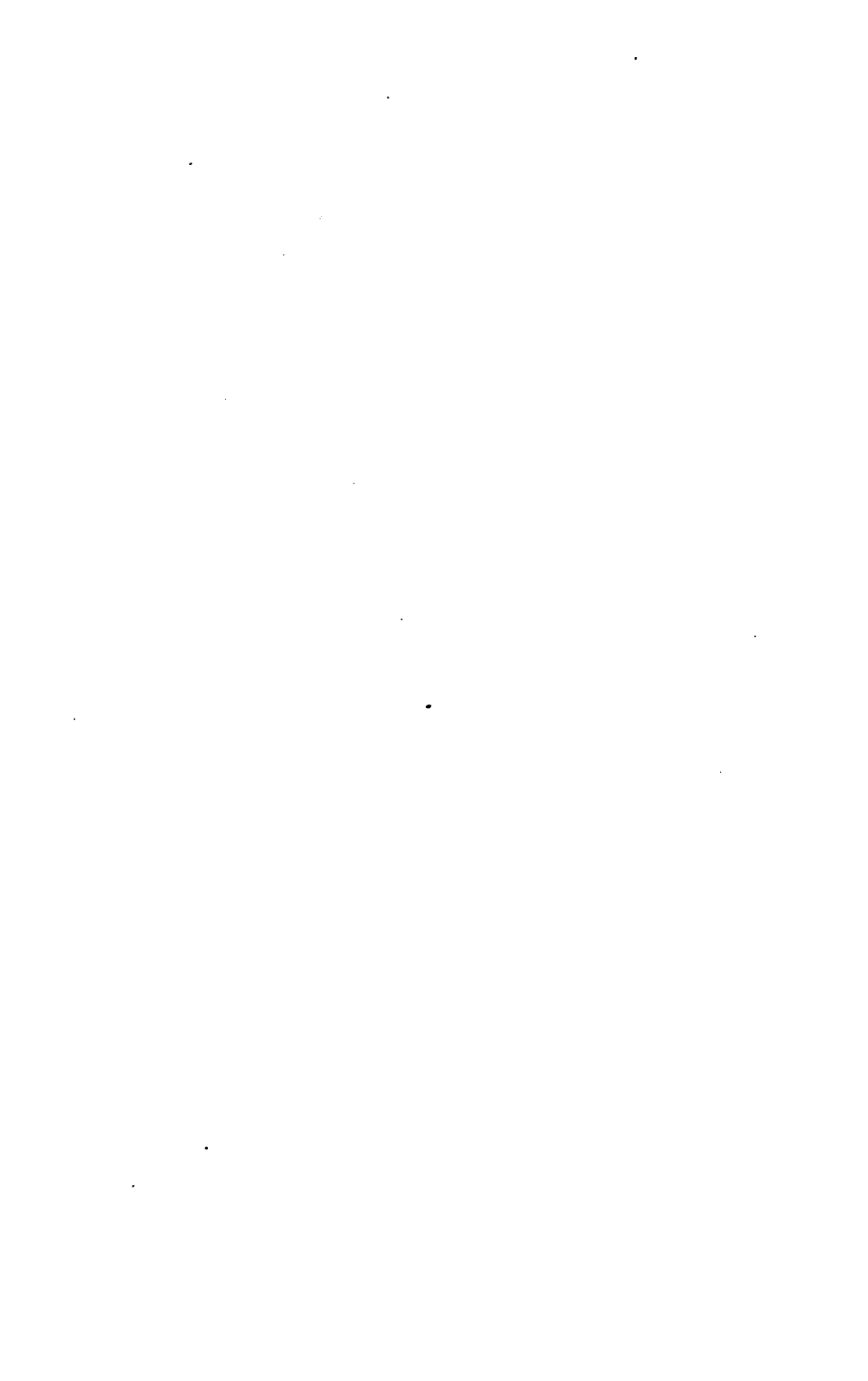
Under this authority orders for licenses for 167 corporations were issued up to August 1, 1907. Of these, 83 are British corporations, 37 American, 19 German, 6 Spanish, and 22 miscellaneous.

One application for a license (the Philippine Plantation Company, a corporation organized in the Territory of Arizona) was held, owing to indications from the documents and papers issued by the company, and from other sources, of a lack of fair dealing with the public, whereupon the application was withdrawn by the agent of the corporation in Manila.

Respectfully submitted.

W. CAMERON FORBES,
Secretary of Commerce and Police.

To the PHILIPPINE COMMISSION,
Manila, P. I.



APPENDIX A.

REPORT OF DIRECTOR OF CONSTABULARY.

BUREAU OF CONSTABULARY,
Manila, P. I., July 1, 1907.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1907.

The province of Samar was changed from the third to the second district during the year for the purpose of equalization, and the constabulary of Romblon, second district, was attached to Capiz, in the third district, when Romblon was made a subprovince of Capiz.

Brig. Gen. Henry T. Allen was present as director until his departure for the United States, May 15, 1907, whereupon the undersigned performed the duties of acting director to June 30, when he was appointed director.

Col. W. S. Scott (Capt., First U. S. Cavalry) and Col. D. J. Baker, jr. (Capt., Twenty-sixth U. S. Infantry), were relieved from duty with the constabulary October 26, 1906. Capt. W. C. Rivers, First U. S. Cavalry, and Capt. M. L. Hersey, Ninth U. S. Infantry, inspectors for constabulary, were appointed colonels and assistant directors of constabulary October 26 and 27, 1906, respectively. Capt. J. B. Bennet, Sixteenth U. S. Infantry, was detailed January 3, 1907, as inspector for constabulary per authority of cablegram dated War Department, December 27, 1906. First Lieut. Louis J. Van Schalck, Fourth U. S. Infantry, was detailed as inspector for constabulary February 15, 1907, per authority of cablegram dated War Department, December 10, 1906.

The enlisted strength of the constabulary, including the medical division and the constabulary band, consisted, on June 30, 1907, of 4,781 men, distributed at 167 stations throughout the archipelago. There have been no scout companies on duty under the civil government during the year, although in Samar and Leyte they as well as regular troops have acted in conjunction with the constabulary in field operations against the hostile pulahanes. All such operations were characterized by the most harmonious relations between the constabulary and the United States troops.

PEACE CONDITIONS.

FIRST DISTRICT.

Conditions in this district are good at present and are steadily improving. The Salvadoristas, the fanatical members of the so-called Santa Iglesia, under the leadership of Felipe Salvador, are still in existence, but have broken up into a number of small, poorly organized bands, among whom there are scattered about 35 guns. This organization has many passive followers and sympathizers throughout the northern provinces of the district, and especially in Nueva Ecija, Tarlac, Pampanga, and southeastern Pangasinan. Salvador has no fixed abode and is constantly in motion; he commits no abuses, and the result is that very little information can be had concerning him from the people of the above localities. Since August, last year, these fanatics have given practically no trouble. In October, 1906, they made an attempt to gain a foothold in Bataan Province, but were unsuccessful. The constabulary encountered an armed band of these outlaws in that month, which resulted in the death of the leader, Nicolas Santiago, and 2 others, the capture or surrender of 4 men, and the seizing of 14 guns and 1 revolver.

"President" Macario Sakay, of the so-called Filipino Republic, "vice-president, secretary of war, and lieutenant-general" Francisco Carreon, "Lieut. Gen." Julian Montalón, and "Brig. Gens." Leon Villafuerte, Lucio de Vega,

and Benito Natividad were placed in jail July 18, 1906, after having unconditionally surrendered one or two at a time. These leaders had for years disturbed the provinces immediately around Manila, and were the nucleus of the outlawry in that section. They were tried by the court of first instance, and on September 28, 1906, Sakay, Montalon, Villafuerte, and Natividad were sentenced to death. They appealed to the supreme court, which had not rendered decision at the date of this report. Carreon was tried separately, and on December 6, 1906, was sentenced to imprisonment for life; he did not appeal therefrom. The conviction of these bandits contributed materially to the peace of the district they had infested.

On April 12, 1907, one Modesto Miaco, constabulary soldier, deserted and stole 9 carbines with the accompanying belts and ammunition from the constabulary cuartel at Balanga, Bataan, gave these to prisoners confined in the provincial jail, who thereupon killed the sentry over them, 10 of the prisoners making their escape. The band, accompanied by Miaco, was pursued by a detachment of constabulary under Lieutenant Bates, who, on April 23, at Talian, Mariwales, succeeded in killing one of the escaped prisoners. The leader of the band, Alfonso Diaz, was killed April 25 near Cabcabin. There are still at large 5 members of this band, including Miaco, whose present whereabouts is unknown, but is supposed to be in the mountains of Porac, Pampanga. Their operations are confined mostly to the provinces of Bulacan and Pampanga.

In Batangas and Cavite provinces, the remnant of Montalon's band, Pablo de Castro, with 5 rifles, is still at large. On May 13, 1907, Corporal Luna with 5 soldiers fought this band of 8 armed ladrones, killing 1. People at Talisay, Tanauan, and Cabuyao, are lending assistance, and the early apprehension of these criminals is expected.

In Cavite, one of Lucio de Vega's followers, Domingo Lumusco, was still in the field with 5 robbers and 2 guns on June 30. This band has since been captured. There are no ladrone leaders at present in Cavite. In February of the present year, the right of franchise was restored and peace conditions there are now excellent.

In Laguna Province there is a small band of about 4 bandits still at large. The leader, Fulgencio de Guia, was recently captured, however, and this feeble organization is now without a head.

The Province of Nueva Ecija is in an unsettled and unsatisfactory condition. Salvador maintains a considerable prestige among the ignorant masses, who are extremely indifferent to the efforts of the authorities in maintaining law and order. There are many vagrants, and petty crimes are of frequent occurrence, while gambling is prevalent throughout the province. The municipal police, as a rule, are generally indifferent. A raid on the town of San Juan de Guimba by an armed band of 13 ladrones in May, 1907, was the only active aggression by an organization during the year. There have been no religious disturbances in the district.

SECOND DISTRICT.

So far as any aggressive outlawry is concerned, this district is generally quiet. There is no criminal organization known to exist in the Provinces of Romblon, Mindoro, or Sorsogon, nor are there any unauthorized arms known to be in the possession of the people.

In Ambos Camarines, a small band, consisting of 12 men under the leadership of Valerio Avila and Nemesio Vargas, has been committing depredations recently near the borders of Tayabas Province. A constabulary force is now operating against them.

In Tayabas Province, a religious-military organization, the "Ejercito Libertador Nacional" so called, was broken up by Governor Quezon and the constabulary near Atimonan and Unisan. Nineteen of its officers surrendered or were captured, and are now awaiting trial by the courts.

Pantaleon Villafuerte, a bandit leader who had long operated around Casiguran, Tayabas, was killed, and his band with 5 rifles and a revolver were captured in July, 1906, through the personal efforts of Governor Quezon. They had robbed the treasurer of Palanan a short time before the capture. The money was recovered. The killing of Villafuerte following so promptly upon this raid put an end to ladronism in that section of Tayabas.

Operations in Samar have been continued by the military, constabulary, and volunteer forces throughout the year. Many prominent leaders, including

Cipriano Amongo, alias Tiducduc, Pedro de la Peña, Agullar, and Atibadoy, have surrendered or been captured from time to time, so that to-day the only remnants of Pulahanism in this island consist of Otoy, Simon Angeles, and Ubaldo Diaz, with several small bands, none of which have been aggressive for many months.

The following, from Colonel Harbord's report, appears to outline the policy to be pursued in this island:

"There have been no aggressions by pulahanes in 1907, and they no longer stand to fight. It is a tedious man hunt by small parties traveling light and, as stated above, may last for years or might be terminated in half an hour by a lucky encounter. The work is one for which the constabulary is particularly suited. It is not, in my opinion, work to which the scouts with their present ideas of impedimenta, necessity for cargadores, etc., are fitted, notwithstanding the great individual enterprise and energy of many of their officers. Both scouts and constabulary, in my judgment, are working together, sincerely sharing, as far as is known, all information obtained by either, and that harmonious cooperation has, with slight exception, prevailed throughout the year. It is so well known that the army has done its work in Samar efficiently and well, and so much of the pacified condition there is due to its tireless scouting, that it needs no reiteration of these facts from the undersigned. They are appreciated by no one more than the constabulary, high and low. The work, however, has now reached that heart-breaking stage of tedious, fruitless marching to and fro on 'noticias,' which does not add to military efficiency, holds no allurements for the military man, and is not a military but a police problem. The burden of furnishing cargadores for marching columns lies heavily on the law-abiding people of Samar and is a serious obstruction to the resumption of ordinary occupations of peace. It is the best judgment of the undersigned that the public interests would be served if the military on Samar were now returned to their ordinary status, their operations to cease, except for practice marches showing the uniform occasionally for moral effect in such portions of the island as may be requested by the provincial governor and can be conveniently granted by the department commander."

THIRD DISTRICT.

Conditions in Cebu appear to be better now than they have been at any time since American occupation. The ladrone band headed by Quintin Tabal and his brother, Anatallo, has been constantly pursued by the constabulary, and with the inauguration of Don Sergio Osmeña as governor the outlaw element found the insular and provincial authorities thoroughly united and determined to clean up the province, and the surrender of these leaders to the governor soon followed. Governor Osmeña has been untiring in his efforts for peace and order and, with the assistance of the constabulary, has succeeded in clearing this province of all professional leaders, among whom may be mentioned Petronillo Esnardo and Ruperto Caballero in the north and Agustin Pardines in south Cebu.

In Iloilo, peace conditions are not deemed satisfactory. Three important outlaw bands are at large, having all told about about 30 firearms in their possession. These with 5 minor bands, supposed to be under their influence, more or less, live in the mountains or foothills, making occasional raids in the lowlands for the purpose of robbing small villages or stealing carabao.

Leyte.—The principal disturbances in the third district the past year have taken place in Leyte. Beginning with the outbreak in June, 1906, at Burauen, aggressions of pulahanes under the active leadership of Faustino Ablen have continued throughout the year, and were brought to a successful conclusion on the part of the authorities only in June last. Since July 24, 1906, on which date Major Nevill, in command of the constabulary forces, and Captain McMasters, Twenty-fourth U. S. Infantry, with a detachment of his company, had an encounter with pulahanes at Tabon-tabon (which was included in the report of the director of constabulary for 1906), the following encounters have taken place in this campaign against the pulahanes by the military, constabulary, and volunteer forces:

On August 9, a column of Regulars under Lieutenant James, Eighth U. S. Infantry, was attacked at Julita. Lieutenant James, Doctor Snyder, Revenue Agent Williams, and several soldiers were killed. September 10, Lieutenant Treadwell, Philippine Scouts, was killed by pulahanes in an attack made upon his camp. December 5, Captain Ham, U. S. Army, with Company L, Eighth

U. S. Infantry, and Lieutenant Yates with 25 constabulary, were attacked near La Paz by a strong body of pulahanes led by Basilio Samson, resulting in the death of Samson, 40 pulahanes, and 5 American soldiers, and the loss of 3 rifles. Lieutenant Yates, Philippines Constabulary, was severely wounded in this fight. The pulahanes withdrew to the mountains, where they remained with many others in hiding until January 6, 1907, when Captain Chrisman, Sixteenth U. S. Infantry, and Lieutenant Hemmett, Philippines Constabulary, with a force of Regular soldiers, constabulary, and volunteers from Dagami, attacked their stronghold. Lieutenant Hemmett was wounded in this fight. From that date there were no more encounters until Lieutenant Snodgrass of the constabulary, with a small detachment and 2 American soldiers, came upon a pulahan camp near Guinarona. The pulahanes immediately dispersed without casualty. Lieutenant Snodgrass was wounded. Following this engagement, pulahanes were rapidly picked up by troops or volunteers or surrendered with many rifles. On June 11, a detachment of Regular soldiers and scouts under Lieutenant Jones, Eighth U. S. Infantry, wounded and captured one of 4 pulahanes, who was afterwards found to be Faustino Ablen, commonly known as "Papa" or "Pope." Faustino, the acknowledged leader of the pulahan movement. His capture ended the campaign. Felipe Idos, with little or no following, is the only leader still at large in the island.

Referring to the civil volunteers, Colonel Rivers, the district director, states:

"Much should be made of the assistance of the people of Leyte themselves in the capture of Faustino and his band. While no doubt their efforts were often without results and ineffective, the people of the towns of Burauen, Dagami, and Tanauan on the east coast, and of Ormoc, Albueria and Baybay on the west coast, turned out sometimes by hundreds and sometimes with a number of four or five thousand in all as volunteers. * * * Many of them went to the mountains on expeditions for a number of days, suffering hardships due to constant rains and to the roughness of trails. The efforts of the provincial and municipal officials were of great assistance to the authorities and were cheerfully given."

This uprising in Leyte embraced only the minority of the people of the central part of the island and included at most only 8 of the 34 municipalities. This outbreak had no connection with the pulahan movement in Samar.

In the island of Negros there exists the remnants of an organization formerly known as Babaylanes, who were fanatical in the sense that in their ignorance and superstition they believed in the efficacy of the anting-anting, and their leader styled himself Pope or "Papa" and claimed to have divine power.

Their present leader, Dionisio Magbuela, commonly known as Papa Isio, is an old man about 65 years of age, a native of Antique, but has lived in Negros since his boyhood. In 1880, he was employed as a herder near Isabela, Negros, and having in a quarrel wounded a Spaniard, fled to the mountains to escape justice.

The Babaylanes had just previously lost their leader and Isio announced himself as pope and was accepted by them. For a number of years his followers were numerous and his influence great. He assisted the insurgents in the overthrow of Spanish authority in 1898 and himself and followers were known as insurgents. He was appointed military chief of La Castellana, Negros Occidental. This increased his power and influence to such an extent that the educated class fearing his power asked in 1899 for American occupation. Isio and his followers began a campaign of murder and arson. Since 1900, he has confined himself to the mountainous country of Negros Occidental and Oriental, but has descended once each year to attack some unprotected part of the province. His following has gradually decreased, until at the present time it consists of perhaps a dozen "remontados" and as many more montescos. His subchiefs are Juan Mayo, Marcelo Tuyoy, Eugenio Talatala, and Eugenio Alcachufas. The first two are natives of Antique. Talatala is a native of Himamaylan and was formerly a member of the Guardia Civil. Eugenio Alcachufas is a native of Cebu, and is said to have commanded the pulahanes who attacked and killed Lieutenant Walker, Philippines Constabulary, in Cebu in 1903. They have 5 rifles and 1 revolver.

Living as they do in the mountainous portion of the island, numberless expeditions have been sent against him without effecting his capture. He formerly exerted great influence over the ignorant mountain people known as montescos and subsisted himself and men by levying on them. On February 12

of this year he sent his band to the lowlands, where they burned Suay, a barrio of Himamaylan, and the following morning attacked and defeated a small detachment of constabulary at Cabancalan and burned the barrio. This was an attempt on the part of Isio to start a general uprising. He did add some montescos to his following. He was attacked by Capt. George B. Bowers and Lieut. E. W. Stoll in his mountain camp at Cunalum on April 12. They killed 1 man and captured a serviceable rifle. Several hundred montescos, formerly followers or believers in Isio, have surrendered and pledged themselves to assist us in his capture. Without their assistance, it is considered impracticable.

FOURTH DISTRICT.

No organized bands have been in operation during the time covered by this report. One attempt was made in Ilocos Norte to organize such a band which was quickly squelched. Constabulary have been used principally in the suppression of crime against persons, breaking up of cattle stealing, frustrating raids by non-Christians in isolated localities, encouraging friendly relations between non-Christian tribes, and in affording protection to the peaceful inhabitants.

FIFTH DISTRICT.

The following are the principal engagements which have taken place in the Lanao district: On June 4, Lieutenant Furlong with Lieutenant Tarbell and 60 constabulary inflicted severe punishment in a hand to hand fight against a number of followers of Mural Hakim at their cotta in the Toroco Valley. With the exception of Lanao, the peace conditions in the fifth district have been generally good. Constabulary forces have been used in many ways, not only in the field, but in performing numerous civil duties of trust and importance. The policy of the civil government in the Moro Province has been to foster the first principles of government, by gaining the confidence of the headmen, by meting out justice and by increasing trade among the Moros by peaceable rather than forcible measures. By these means and occasional demonstrations the despotic power formerly held by sultans and other chiefs has been considerably curtailed.

In the Cotabato district, two minor engagements with outlaws under Sultan sa-Dimabara resulted in the killing of 8 outlaws.

Although no actual demonstration has been made against the government by outlaws in the Buldoon region, a bad element has existed there, entailing considerable work on the part of the constabulary.

CHIEF SUPPLY OFFICER.

Attention is invited to the complete report of the chief supply officer as to the methods and workings of this most important department of the constabulary.

During the year the enlisted personnel has been partially armed with the Krag carbine, modified by the addition of the rifle bayonet—a most important change.

Provided with a magazine arm of great range and accuracy, with smokeless powder ammunition, and equipped with a bayonet, every soldier so supplied naturally feels superior now to any antagonist he may meet. He no longer must depend on firing one shot and then clubbing his gun in the almost inevitable bolo rush.^a

The following general remarks from the chief supply officer's report indicate results of the system of retrenchment practiced throughout the service the past year:

"There was actually appropriated for the bureau of constabulary for the fiscal year 1906 ₱3,744,121.36. Besides this the bureau of navigation gave us free transportation, costing ₱150,000, so that in reality there was appropriated for the bureau of constabulary for the fiscal year 1906 ₱3,894,121.36. For the

^a Lists showing the result of operations, arms captured, outlaws killed and captured, and constabulary casualties, have been omitted and are on file in the Bureau of Insular Affairs, War Department.

fiscal year 1907 there was appropriated ₱3,151,800. Out of this we have paid all of our obligations to the bureau of navigation; have in part rearmed the constabulary, and have on hand funds available to complete this rearmament; we have also paid ₱79,000 for shoes that we expected at the time of the last annual appropriation to sell to the army, and had on hand at the end of the fiscal year funds sufficient to meet all outstanding obligations.

"This reduction of ₱742,321.36 from the expenditures for the previous year was obtained by reducing the stock of clothing and other supplies on hand in our bodegas in this city by a slight reduction in the enlisted strength, and, above all, by careful pruning of the small expenditures in all of our 200 or more stations. These economies, while seemingly small in each case, were large in the aggregate.

"Our total refunds for services and supplies to the insular treasury for the fiscal year 1907 amounted to ₱85,947.96."

MUNICIPAL POLICE.

The municipal police organized in the various municipalities throughout the archipelago consists of 18 captains, 96 lieutenants, 356 sergeants 654 corporals, 4,630 privates; total, 5,754.

The several district directors report their efficiency in one province as very good, 12 good, 2 fairly good, 15 fair, and 9 poor. From no province is their efficiency rated excellent.

In some municipalities municipal police are paid as little as ₱4.50, ₱5, ₱6, and ₱7 per month. Whenever police are underpaid to this extent one of two things is true—either the man appointed to the police force has some other business to which he devotes his time and accepts his police salary as a kind of gratuity from the presidente, or he uses his official position to augment his income illegitimately. Appointment of police has become in some municipalities to be considered as a perquisite of the office of the presidente.

Section No. 26, act No. 82, makes the police go out of office with the presidente, and thus they are changed with each new municipal administration, which operates against their efficiency. They are still used in many places as servants for the presidente rather than as police. The director of the second district knows of one case where on a visit to a town the chief of police was a cook in the house where the governor was entertained. In most towns in the United States a town marshal and a night watchman take care of cities the size of towns here that are now equipped with from 12 to 20 police.

OFFICERS.

The number of officers authorized is barely sufficient to meet the demands upon the service if all were present for duty. Vacancies due to separations, officers ill and on leave, and occasional ones detached for important service with other bureaus, all tend to keep the active force below what is deemed necessary for the proper performance of all duties.

The quality of new appointments to the service is growing better. The young men secured from American colleges, while yet lacking in the experience so necessary to their complete equipment, are giving evidences of industry and sincerity that promise well for the future.

The preliminary instruction given at the school to new appointees, covering their civic and military duties and their relations to the people, has been productive of much good. These officers now enter upon their duties better prepared therefor to the manifest advantage of the government. At the close of the fiscal year Capt. J. B. Bennet, Sixteenth U. S. Infantry, inspecting officer, was relieved as superintendent of the school by Capt. Charles J. Kindler, of the constabulary.

Since the last report 39 officers have resigned, 3 died, and 10 were dismissed for cause.^a

Very respectfully,

H. H. BANDHOLTZ,
Director.

THE SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

^a Tables showing constabulary strength and station list have been omitted and are on file in the Bureau of Insular Affairs, War Department.

LIST OF TOWNS OCCUPIED JUNE 30, 1907.

Manila.....	Constabulary school and casuals at constabulary barracks, Calle Santa Lucia, Intramuros.
Albay.....	Albay, Ligao, and Tabaco.
Ambos Camarines.....	Nueva Caceres, Goa, and Daet.
Antique.....	San Jose, San Remigio, Valderrama, and Oulasi.
Bataan.....	Balanga.
Batangas.....	Lipa, Talisay, Tranca, Paliparan, Santa Clara, and Tanauan.
Benguet.....	Baguio, Loo, and Paoy.
Bulacan.....	Malolos and Balluag.
Cagayan.....	Tuguegarao, Appari, Abulug, and Mauanan.
Capiz.....	Capiz, Tapaz, and Balasan.
Cavite.....	Cavite, San Francisco de Malabon, Ulat, Alfonso, Silang, Paliparan, and Amadeo.
Cebu.....	Cebu, Camp Seno, Danao, and Naga.
Cotabato.....	Cotabato.
Davao.....	Davao, Mati, and Boston.
Iloos Norte.....	Laoag, Dingras, Santa Matilde, Bangui, and Badoc.
Iloos Sur.....	Vigan, Santa Catalina, Candon, Villavieja, San Jose, Bangued, San Juan, and Sapid.
Iloilo.....	Iloilo, Jaro, Camp Sisson, Leon, Alimodian, Maasin, Janluay, Acao, San Rafael, and Lemery.
Isabela.....	Iligan, Echague, San Isidro, and Mayayao.
La Laguna.....	Santa Cruz, Calamba, Santa Rosa, Alaminos, Stranglupa, Santo Domingo, Caluang, and San Ildefonso.
Lanao.....	Marahui, Iligan, and Dansalan.
La Union.....	San Fernando, Rosario, and Alliem.
Lepanto Bontoc.....	Cervantes, Bontoc, Lubuagan, and Balbalasan.
Leyte.....	Tacloban, La Paz, Abuyog, Camp Worswick, Dolores, and Buraen.
Misamis.....	Cagayan and Misamis.
Mindoro.....	Naujan.
Nueva Ecija.....	San Isidro, Cabanatuan, San Jose, and Allaga.
Nueva Viscaya.....	Bayombong, Payauan, Banaue, Quilang, and Aritao.
Negros Occidental.....	Bacolod, Camp Barrett, La Castellana, Isabela, Cabancalan, Guimbalaon, Magallon, Himamaylan, and Binalbagan.
Negros Oriental.....	Dumaguete and Guijulingan.
Pampanga.....	San Fernando, Arayat, and Floridablanca.
Pangasinan.....	Dagupan, Tayug, Alaminos, and Rosales.
Palawan.....	Cuyo, Ooron, and Balabac.
Rizal.....	Pasig, Malabon, Montalbon, Novaliches, Tanay, Zapote, and Muntinlupa.
Romblon.....	Romblon.
Samar.....	Catbalogan, Calbiga, San Jose, Concord, Biri, and San Julien.
Sorsogon.....	Sorsogon and Masbate.
Sulu.....	Siasi, Bongao, and Sitanki.
Surigao.....	Surigao, Talacogan, and Butuan.
Tarlac.....	Tarlac, Paniqui, and Concepcion.
Taybas.....	Lucena, Lucban, Calauag, Tiaong, Unisan, and Agdangan.
Zambales.....	Iba and Santa Cruz.
Zamboanga.....	Zamboanga, Dapitan, Dipolog, Calarian Prison, San Ramon, and Tacuran.

REPORT OF DISTRICT DIRECTOR, FIRST DISTRICT.

FIRST CONSTABULARY DISTRICT, OFFICE OF DISTRICT DIRECTOR.

MANILA, P. I., July 26, 1907.

SIR: I have the honor to submit the following report of operations and conditions in the first constabulary district for the fiscal year ended June 30, 1907.

The district comprises the provinces of Bataan, Batangas, Benguet, Bulacan, Cavite, La Laguna, Nueva Ecija, Nueva Viscaya, Pampanga, Pangasinan, Rizal, Tarlac, and Zambales, the same as on the date of the last annual report.

There have been 4 district directors or acting district directors during the year, as follows:

Col. H. H. Bandholtz, Philippines constabulary, from July 1, 1906, to April 19, 1907.

Lieut. L. T. Van Schaick, U. S. Army, from April 20, 1907, to May 16, 1907.

Col. Mark L. Hersey, Philippines constabulary, from May 17, 1907, to June 7, 1907.

Capt. Herman Hall, U. S. Army, from June 8, 1907, to June 30, 1907.

The strength of the constabulary for the district on the date of the last annual report was 67 officers and 1,384 enlisted men. Present strength, June 30, 1907, 66 officers and 1,405 enlisted men, included in 33 organizations. A reduction is hardly advisable at present, though during the year the enlisted strength may be somewhat reduced. I am in favor of a larger proportion of officers to enlisted men as conditions improve, for it is from the officers we get the best

service, and it often happens that one good careful officer in a province is of more value than a detachment of men.

Rents on June 30, 1906, were ₱2,370.78 per month, and at present date, June 30, 1907, are ₱1,576.83 per month. As permanent buildings are constructed the rents can be further reduced.

PRESENT PEACE CONDITIONS.

Conditions as to law and order throughout the district are good and steadily improving. No large organized ladrone bands are at large. The Salvadoristas, or followers of Santa Iglesia, have with their armed bands about 35 guns. The passive followers of Salvador are very numerous, especially in Nueva Ecija, Tarlac, and southeastern Pangasinan. It seems impossible to obtain information about Salvador's location, or that of his armed followers; his people will not tell, as he apparently treats them well, and he will not present himself. When his bands appear they have been continually pressed until they fade away.

RELIGION AND POLITICS.

The Independent Catholic Church, known as the Aglipay faction, is about on the same status as last year, possibly less important. Followers are mostly in Tarlac and Pangasinan. There have been no serious disturbances during the past year occasioned by differences in religious feeling.

The Calorum sect has some followers in Batangas, Cavite, and Tayabas, but they are harmless.

OUTLAWS AT LARGE.

There are not many, and excepting Salvadoristas there are no large organized bands.

Modesto Miaco has possibly 13 guns; his operations are confined mostly to the provinces of Bulacan and Pampanga, and possibly Tarlac and Nueva Ecija. He is now supposed to be in the mountains of Porac, Pampanga.

Felipe Salvador's armed bands control about 35 guns, which seem to be scattered, and during the latter part of the year have not been used in raids or robberies.

In Batangas and La Laguna Provinces, Pablo de Castro, with 4 bandits and 5 rifles, remnants of Montalón's band, is still at large, but with the aid of the people of Talisay, Taunanan, and Cabuyao, their destruction is predicted.

In Benguet, at Benaltin, district of Kayupo, it is reported that there is a party with 10 rifles, captured some years ago from the Spaniards, but this has not been confirmed.

In Bulacan, Severino Rodriguez, alias "Berong," is supposed to be with Salvador in Pampanga or Nueva Ecija with 9 rifles and 3 revolvers.

In Cavite, Domingo Lumusco, one of Lucio de Vega's followers, is out with 5 robbers, and 2 guns, both unserviceable, and 1 revolver (since June 30, 1907, Lumusco has been captured).

In La Laguna Province is a small band known as the "Degul," headed by Fulgencio de Gula, with 3 followers and 3 revolvers.

In Nueva Ecija are some bands of Salvadoristas, having a total of about 35 guns, as mentioned above.

Pampanga is sometimes visited by Salvador's bands, but has no other organized ladrone party.

SPECIAL EVENTS.

The constabulary has been busy pursuing and capturing ladrones and carabao thieves, prosecuting, patrolling, and making arrests, but only important occurrences will be mentioned.

Bataan.—The Salvadoristas, or followers of Santa Iglesia, have a few followers in the northeastern part, but they are passive, and an effort made by certain leaders of the sect to gain a greater foothold in the province during June, July, and August, 1906, was unsuccessful. An armed band of these fanatics was encountered by the constabulary during August, 1906, resulting in the death of the leader, Nicolas Santiago, and 2 others. Two others were captured and 2 surrendered. Fourteen guns and 1 revolver captured.

During the night of April 12, 1907, a jail delivery took place at the provincial jail, through the connivance of one Modesto Miaco, a constabulary soldier.

Miaco took 9 carbines, 8 belts, and 320 rounds of ammunition from the cuartel and armed the prisoners through the window of the jail. The prisoners killed the sentry, and 10 of them made their escape. Miaco and the prisoners robbed a tienda at Bagac the following night after their escape. They met with little sympathy among the people. One of their number was killed by an expedition under Lieutenant Bates at Talian, Mariveles, on April 23. Their principal leader, Alfonso Diaz, was killed near Cabcabin by Pedro Pandifo on April 25. One member having deserted them, and 3 others having surrendered, the 5 remaining ones seem to have left the province for good.

Bulacan.—Only minor thefts and a limited number of crimes are of record.

La Laguna.—In Laguna Province, May 13, 1907, Corporal Luna with 5 soldiers fought 8 armed ladrones under De Castro, and killed 1—1 soldier killed and 1 wounded.

Nueva Ecija.—May 13, 1907, about 13 ladrones, armed with 3 revolvers, raided the town of San Jose de Gulimba, forcing the treasurer to open the municipal safe, which they looted, carrying away about ₱4,779.13. No resistance was offered by the police, who were, however, unarmed—there were 5 at the municipal building at the time. This robbery may have been a conspiracy on the part of certain municipal officials and the ladrones.

The province of Nueva Ecija is in an unsatisfactory condition, largely through ignorance of the masses; the people are indifferent and render very little aid in assisting the government in maintaining law and order. Thieving and robberies are frequent; gambling is prevalent, vagrants numerous, and policemen generally indifferent. Salvador has a strong hold on the people and this blocks advancement. Without reflecting upon the present senior inspector, it has been decided to send a new officer there, who may get better results. This province will be given special attention.

MUNICIPAL POLICE.

Steps have been taken to gradually reduce the number of rifles and shotguns held by them, and issue revolvers instead.

July 31, 1906, the police of the district had in their possession 808 rifles and 225 shotguns. June 30, 1907, the number is 705 rifles and 190 shotguns.

In some towns the police render good service and are well organized, but as a rule such is not the case. A revision of the law with regard to the organization of the municipal police is recommended, exempting them from the operations of section No. 26, act No. 82, and making the removal for "cause" more genuine.

If a board, to consist of the president of the municipality, the justice of the peace, and the senior inspector, could make all appointments and removals, a more efficient force could be maintained.

Municipalities spend so much money on their police that it is unfortunate the people do not get better returns. As a rule it would be advisable to reduce the forces in number and increase the salaries, for good men can not be obtained for the usual present salaries. However, a good police force is generally found with an efficient presidente.

CONSTABULARY.

Arms, equipment, uniform, and subsistence are quite satisfactory.

MEDICAL ORGANIZATION.

It is recommended that as a rule 1 hospital corps man be assigned to each company, provided well-instructed men can be obtained. The constabulary medical division is rendering good service.

BUILDINGS.

While satisfactory, it is recommended that the scheme for construction of permanent buildings be extended throughout the district.

TRANSPORTATION.

Satisfactory, though more serviceable riding ponies are needed to replace some that have become unserviceable.

I am not in favor of substituting American or Australian horses for native ponies; the latter are less expensive, stand the climate better, and are more adapted to getting about in this country.

Senior inspectors are almost unanimous in recommending revision of the law governing thefts of animals and I heartily concur in this. The following suggestions are submitted:

Make it a more serious offense to have stolen animals in one's possession and there will be a fewer number purchased.

Make it a more serious crime for the stealthy unarmed thief who appropriates an animal.

The senior inspector of Benguet claims that during the summer season he has not enough men to furnish the various details, guides, etc., and requests a company of 65 men during this season.

Retrenchment has been practiced throughout the year, and economy will be enforced so far as possible with efficient service.

As time goes on the constabulary is becoming more and more servants of the people and guardians of the rights of the masses; abuses are not tolerated and are gradually being eliminated.

It is recommended that a law be framed authorizing constabulary officers, or army officers on duty with the constabulary, to administer oaths when making investigations, specially directed by the Governor-General. It is often difficult to promptly get the services of an official who possesses this power.

Herewith are accompanying tables showing work accomplished by the constabulary and municipal police, and other data with reference to the latter.^a

Very respectfully,

HERMAN HALL,
District Director.

The EXECUTIVE INSPECTOR, PHILIPPINES CONSTABULARY,
Manila, P. I.

REPORT OF THE DISTRICT DIRECTOR, SECOND DISTRICT.

SECOND CONSTABULARY DISTRICT,
OFFICE OF DISTRICT DIRECTOR,
Albay, P. I., July 22, 1907.

SIR: The undersigned has the honor to submit the following report for the year ended June 30, 1907:

From July 1, 1906, to January 10, 1907, the district was commanded by Maj. Peter Borseth, assistant director, Philippine constabulary. Since January 10, this year, the command has been exercised by the undersigned with Major Borseth as assistant until May 1, when the latter was ordered from the district.

In March the headquarters of the second district were changed from Lucena to Albay, to the very great advantage of administration. April 1, the province of Samar was added to the district.

PRESENT PEACE CONDITIONS.

Generally, quiet prevails throughout the district. This is uniformly true as far as any aggressive outlawry is concerned. In Romblon, Mindoro, and Sorsogon Provinces, no organizations for crime are known to exist, and no arms are known to be in the possession of unauthorized parties.

In Tayabas Province, the leaders Marcelo Parafino and Esteban Deseo, of the "Ejercito Libertador Nacional," disorganized in April, and three unimportant followers, are still at large, but their prestige is gone. They have 1 revolver, but no ammunition.

In Ambos Camarines, operating near the Tayabas border, is a small band under Valerio Avila and Nemesio Vargas. The former gave much trouble in the Ragay region in 1904. Vargas was the real leader of a band belonging over on the Tayabas side near Calauag, whose active chief, Juan Kabayo, was killed by constabulary last December in North Camarines. Vargas in June joined Avila and between them they have 4 Remington rifles, 1 Mauser rifle, and 4

^a Tables showing the following have been omitted and are on file in the Bureau of Insular Affairs, War Department: Arms captured; animals captured; encounters; enlistments and desertions; outlaws killed and captured; work performed by municipal police.

pistols, with about 15 cartridges for each rifle and less for the revolvers. There are probably 12 men in the band. This band has been within the last three weeks driven from its rendezvous near Ragay, where Avila has many relatives and has the sympathy and doubtless the assistance of the municipal officials.

In Albay, near Jovellar, a party of 3 men armed only with bolos have, in the last few weeks, been committing robberies in their own municipality. Their leader is Apolonio Guinaha—a criminal at large since Spanish times.

In Samar, Otoy, Simon Angeles, and Ubaldo Diaz, with perhaps 25 guns and following in several small bands, are what is left of pulahanism. The day when troops by going into the pulahan district could get a fight has long passed; the pulahanes have committed no aggression and made no stands for many months. Samar is a large island, and perhaps the most difficult in the archipelago in which to locate small bands of outlaws, and the hunt for this remnant of pulahanism may be terminated by a lucky encounter any time or may drag out for years. Troops and constabulary are constantly on the go from stations near the infested district, destroying camote patches on which the outlaws subsist, and following up "noticias." The former pulahan following of thousands has settled down to cultivation of the hemp hills, and small settlements are crystallizing around the interior constabulary stations of Magtaon, San Jose, and Biri, as well as barrios being rebuilt near the coast towns.

RELIGIOUS AND POLITICAL CONDITIONS AS AFFECTING PEACE.

There is little religious agitation at present in this district. In Albay there is bitter feeling between the Roman Catholics and the Presbyterians. The proselytizing by the latter sect has antagonized the priesthood. In Ambos Camarines, Romblon, Mindoro, and Sorsogon there is no religious agitation. In Samar the people are more devoted to the outward observance of religion, at least, than in other provinces of the district. The control of the priest there is more absolute. It is said that a priest in his robes could at any time go through the pulahan country with safety and be received with almost the honors of worship, and the leaders of the pulahanes have always claimed priestly powers. Samar has a large number of Spanish priests, many of them young men, and there does not appear the antipathy to the friar that is observed in Luzon. It is a pity that these Spanish priests can not be replaced by men of some race thoroughly in sympathy with the aims of our government.

In Tayabas some Protestant proselytizing is being done at Lukban and Tiaong.

The Colorum has its headquarters at Dolores, in the pueblo of Tiaong, Tayabas. It is strong only in that pueblo, but has adherents in Lukban, Sariaya, Tayabas, and Pagbilao. The principal following outside of Tiaong comes from the ignorant people of Rizal, Laguna, Bulacan, Batangas, and Cavite Provinces, being strongest in towns where outlawry abounds. This Colorum breaks no laws and gives no trouble now, but it may grow into a serious menace at any time.

A discouraging indifference is shown to politics in several provinces, which will result in some poor characters being chosen to the first assembly. The registration has been small and the vote will be light. In Albay the Progresista party seems more active than its opponent. In Sorsogon, Romblon, and Tayabas the whole population seems swept off its feet by the independence idea. Only a few men of prominence in those provinces have been strong enough to stand in opposition. In Samar more well-known men are Progresistas. In Ambos Camarines several leading men, including the governor and fiscal, are Progresistas, but great activity is being shown by Independista candidates for the Assembly. One is a man returned from eighteen years' absence, mostly as a member of the Hongkong junta, and he is making speeches that border on sedition, if they do not actually cross the line. Peace is not considered to be in peril from any political movement in any part of the district.

SPECIAL EVENTS BY PROVINCES.

In Albay, Ramblon, Mindoro, and Sorsogon there have been no special events during the year.

In Ambos Camarines Nemesio Vargas, with a few men from Tayabas, has joined Valerio Avila, who, desperately wounded in 1904, was long supposed

to be dead. The two late in May formed a band near Ragay, which is Avila's home, and where he has relatives and friends and gets assistance. The number of arms held by this band is given above. The senior inspector has had the region between Ragay, Daet, and the Tayabas border thoroughly scouted, and on the night of June 14 struck their camp, a few miles from Quilbay. Unfortunately, all the men were away on a hunting and fishing trip, and were not in the camp when surrounded. The wife of Avila was captured, and some documents found implicating municipal officials of Ragay. Operations are in progress against the band.

In Tayabas, where quiet had reigned for several years, there was a revival in the early spring of a part of the old Reus band. A religious-military organization was formed near Atimonan, under the leadership of Marcelo Parafino, styled the Vi-Rey, and Esteban Deseo, commandante-general. The organization was religious, but with the stated intention of rising for independence when Japan should land arms on the beach at Atimonan. All the individual titles were military, and the organization was styled the "Ejército Libertador Nacional." Several expeditions near Atimonan and Unisan disorganized the band, and only 5 men holding high titles in the organization are now at large, including the 2 above named. That this organization attained the size it did before knowledge of it reached the authorities was due to the stupidity or pernicious inactivity of municipal officials of Atimonan, all of whom, with one exception, were removed by Governor Quezon. The governor himself was most active and energetic in the pursuit and disorganization of this band, taking the field in person. Captured documents show that it had had a desultory existence in the Atimonan-Unisan hills since 1903. The revival of this band and that of Avila shows the practice of the Filipino outlaw, when closely pressed, to go into hiding for months or years, with the guilty knowledge, probably, of municipal officials near him, only to reenter on a career of crime when things have quieted down, peace officers have been changed, and the memory of his former deeds has grown faint. Nineteen officers of this "Ejército," including 2 lieutenant-generals, and others as low as one lieutenant, were captured or surrendered during April and May and are being now tried at Lucena. The men remaining out are in pairs or threes, and the hunt is still being conducted against them.

The fine work of Governor Quezon and Major Borseth in killing Villafuerte near Casiguran last July, was covered in the report of the director of constabulary for 1906.

In Samar operations by military, constabulary, and volunteers have continued through the year. In November Captain Abuke of Catarman, in command of a company of volunteers, killed Pedro de la Cruz in an engagement with his band. In the same month Major Murphy, in command of a mixed force of constabulary and volunteers, in an engagement with the band of Papa Pablo, killed the latter, the principal, oldest, and most celebrated of the pulahan chiefs. In January a detachment under Lieutenant Edmondson killed the pulahan leader Picardal. In April an expedition under Lieutenant Burbank is supposed to have wounded Otoy, the present head of pulahanism. At different times Pedro de la Peña, Aguilar, Otibadhoy, and others of prominence, have surrendered to various authorities. Occasional surrenders of single arms are being made—3 have occurred in June. Operations are still continued by scouts and constabulary. There have been no aggressions by pulahanes in 1907, and they no longer stand to fight. It is a tedious man hunt by small parties traveling light, and as stated above may last for years, or might be terminated in half an hour by a lucky encounter. The work is one for which constabulary are particularly suited. It is not, in my opinion, work to which the scouts, with their present ideas of impedimenta, necessity for cargadores, etc., are fitted, notwithstanding the great individual enterprise and energy of many of their officers. Both scouts and constabulary, in my judgment, are working together sincerely, sharing so far as is known all information obtained by either, and harmonious cooperation has, with slight exceptions on the part of an occasional small-calibered officer, prevailed uniformly throughout the year. It is so well known that the army has done its work in Samar efficiently and well, and so much of the pacified condition there, is due to its tireless scouting, that it needs no reiteration of these facts from the undersigned. They are appreciated by no one more than by the constabulary high and low. The work, however, has now reached that heart-breaking stage of tedious, fruitless marching to and fro on "noticias," which does not add to military efficiency, holds no

allurements for the military man, and is not a military but a police problem. The burden of furnishing cargadores for marching columns lies heavily on the law-abiding people of Samar, and is a serious obstruction to the resumption of the ordinary occupations of peace. It is the best judgment of the undersigned that the public interest would be served if the military on Samar were now returned to their ordinary status; their operations to cease, except for practice marches showing the uniform occasionally for moral effect in such portions of the island as may be requested by the provincial governor, and can be conveniently granted by the department commander.

MUNICIPAL POLICE.

The police of Samar are a fairly efficient body of men. Their number has during the year been decreased and the saving used to increase the pay of those who remain. They have taken part with constabulary and volunteers in several expeditions. During the whole year they have been directly under charge of a constabulary officer, First Lieut. W. A. Burbank, and lately under Lieut. Juan Sulse, both of the constabulary of Samar. The method has been attempted of leaving the officer in charge in each town for some days, instead of hurrying through inspections. That necessitates an officer who can devote his time to nothing else. If officers could be had, it would work as well in any other province.

In Ambos Camarines single individuals on the police force of the several towns have been assembled for a month at a time at the capital for instruction. The senior inspector imparts drill and discipline, and the fiscal and others, some knowledge of the laws affecting them and their duties. This police has improved during the year. The same plan has been tried in other provinces, but has not succeeded, owing to several causes.

In other provinces of the district the efficiency of the municipal police remains about as it was last year—poor. In a way the efficiency of the police keeps pace with the intelligence of the other municipal officials. A good presidente has at least an obedient police. The undersigned realizes the possibilities in a fine municipal police force, but the outlook is very discouraging. The police afford patronage dear to the heart of the politician, and as they are generally managed in this district give a personal service to municipal officials, which has come to be looked on as a legitimate perquisite of office. They can only be made efficient where the governor is in thorough accord with the senior inspector and acts on his recommendations. Presidents and sometimes governors are sensitive as to suggestions from the senior inspector, who is emasculated of any power over police except to inspect and report. If the power of appointment and removal were vested in the senior inspector, the efficiency of the municipal police would double in six months, and continue to improve. Under the present system they do not do their duty, and are generally messengers, muchachos, cooks, etc. The undersigned is much opposed to giving firearms to the police. Arms in the hands of police here lead to deplorable abuses, and none exist in this district, except in some towns of Samar, capable, in my opinion, of handling any situation desperate enough to require firearms. The possession of firearms by municipal police is the very basis of the "voluntary contributions" system—the worst form of oppression left by Spain in these islands. The district director should be given finality in deciding that municipalities in his district may not have arms—the question of whether they may have them, even when he is willing, being, as now, settled by superior authority. Accurate records of work accomplished by municipal police are not obtainable. In some districts, small and compact, where travel is by land, inspections are made each month, but in others much more rarely. A compilation of such information as is available regarding municipal police is appended and marked "A."^a

ARMS, EQUIPMENT, UNIFORM, AND SUBSISTENCE OF CONSTABULARY.

The arms will be satisfactory when all are armed with the remodeled Krag carbine. The Springfields are now worthless. The equipment is satisfactory. Some method of carrying the blanket in a roll held by thongs at the top of the

^a This has been omitted and is on file in the Bureau of Insular Affairs, War Department.

haversack, the whole carried by straps around each shoulder, as native cargadores have carried their burdens for centuries, should be devised. The present large haversack dangling against the legs of a small soldier and swinging forward every time he stoops is unsightly and a burden. The uniform is satisfactory, except that woolen puttees should be substituted for leggings as soon as possible, as is understood to be the intention. The sample shoe of canvas with hemp sole soaked in tar, bellows tongue, slight heel stiffening, furnished for trial to the constabulary of Samar some months ago, was tried by the undersigned long ago in Mindanao and in every snipe-hunting season since, and is believed to be the very best field shoe we can obtain. Such, too, is the opinion of some army officers who have seen it in Samar.

MEDICAL ORGANIZATION.

Satisfactory in personnel but inadequate in numbers.

BUILDINGS.

The constabulary owns the barracks at Nueva Caceres. A new barracks has been erected and is soon to be occupied at Catbalogan. Temporary nlpa barracks have been erected at Calbiga and Magtaon, and inherited at San Julian. Negotiations for a building and grounds in Sorsogon await only the pleasure of the court of land registration for their completion, and we shall then have there as good a constabulary location as there is in the district. During the year the province of Albay deeded to the insular government a site for a headquarters building for the district, and a building has been promised.

TRANSPORTATION.

Since March 1 the cutter *Negros* has been on duty in the district. Such a steamer is a necessity, and the inspections in a district with a thousand miles of Pacific coast line can not be made without one. That inspections must be made and that we must be prepared for emergencies is axiomatic, and the money spent for this cutter will be well spent. Naturally the bill for transportation grows larger in the constabulary as the force grows smaller, and the 4,500 men of to-day require proportionately more than the 7,500 of two years ago. Some animals have been added to the district, generally replacing those worn out in service. Each senior inspector is provided with a small boat of some kind. A launch is a necessity in Samar if peace is to be maintained with the 5 companies allowed that province. The province is willing to bear half the expense of hiring such a launch, and with the long coast line on the west, usually navigable for small launches, and the several large rivers, one would be constantly and effectively used.

DISTRICT BAND.

During the year 30 men have been detailed on special duty at these headquarters and have been instructed as a band. The effective strength of companies has been diminished correspondingly. The instruments have been bought by assessments on subsistence savings, it being understood that the band shall visit proportionally each province whose companies contribute, when such visits can be made without additional expense to the government. The experiment has been a decided success. The efficiency of a police is not measured by the number of arrests it makes, but by the creation and maintenance of good feeling among the people, making arrests unnecessary. Probably no 30 men in the district have done so much toward the creation of that good feeling as the district band. Certainly they have been far more useful than any corresponding number of men with carbines—and if necessary they can always resume the carbines. It is believed that this really important part of our work should be recognized by law and helped in the appropriations.

DIALECTS.

Special attention has been given by the undersigned this year to encouraging American officers to learn native dialects and to Filipino officers to learn English. The results are that in 1907 to date 11 officers have passed examinations.

This district now has in it 13 qualified officers out of 27 in the entire constabulary who have so qualified. The examinations of 3 more are pending.

RECOMMENDATIONS.

Recommendations on special subjects have been given under the headings which have preceded this. On general subjects the undersigned can do no better than to renew recommendations made in his previous annual reports.

For tabulation of work accomplished during the year see Appendix "B."
Respectfully submitted.

J. C. HARBORD,
District Director.

The EXECUTIVE INSPECTOR,
BUREAU OF CONSTABULARY,
Manila, P. I.

REPORT OF THE DISTRICT DIRECTOR, THIRD DISTRICT.

THIRD CONSTABULARY DISTRICT,
OFFICE OF DISTRICT DIRECTOR,
Iloilo, Panay, P. I., July 22, 1907.

SIR: I have the honor to submit the following annual report for the third constabulary district for the fiscal year ended June 30, 1907:

As Col. W. C. Taylor had charge of the district the greater part of the year—up to March 8 last—and as he was compelled to go suddenly to America on leave of absence without writing his report, this report will necessarily be incomplete. The undersigned succeeded Colonel Taylor in charge of the district on March 9. At the same time Capt. R. W. Jones was detailed as assistant director of the district. He has just been relieved, having been ordered to duty in the director's office in Manila.

TERRITORIAL EXTENT—POPULATION.

The provinces included in this district, with their population, are given in the table hereunder. They include more than one-third of the population of the archipelago, including 5 of the 6 most populous provinces in the islands.

Province ^a	Area.	Population.		Total.
		Civilized.	Wild tribes.	
Antique.....	1,184	131,245	2,921	134,166
Bohol.....	1,511	269,223	-----	269,223
Capiz.....	2,322	277,940	5,629	283,569
Cebu.....	1,939	653,727	-----	653,727
Iloilo.....	2,027	403,932	6,383	410,315
Leyte.....	3,006	388,922	-----	388,922
Negros Occidental.....	3,180	303,660	4,642	308,302
Negros Oriental.....	1,864	184,889	16,605	201,494
Total.....	16,935	2,613,506	36,180	2,649,718

During the year the Province of Samar was transferred, on March 31, to the second district, and recently the Province of Romblon has been added from the second district by reason of having been annexed to the Province of Capiz.

DISTRIBUTION OF THE CONSTABULARY.

The constabulary force allowed the district is distributed as shown below, the stations being omitted, as the appendix usually submitted with the director's report shows the stations and the number of men at each.

^a This has been omitted and is on file in the Bureau of Insular Affairs, War Department.

	Number of men.
General-service companies	135
Antique	80
Bohol	9
Capiz	105
Cebu	184
Iloilo	188
Leyte	141
Negros Occidental	141
Negros Oriental	47
Band	28
Total	1,058

The district is in need of officers, being much more short than some of the other districts, which fact has been reported to the director who will remedy the matter when practicable. The province of Leyte should have an additional company of 46 men for the southern portion. Otherwise the force seems sufficient for police purposes and is apparently distributed where most needed. Two of the three general-service companies are still in Leyte and one in Negros. One of the Cebu companies is still on detached service in Leyte. The number of men allowed this district two years ago was 1,900. The conditions have improved much in the past two years.

MILITARY GARRISONS—SCOUTS.

Within the limits of this district there are stationed 2 regiments of infantry distributed in 5 garrisons—2 on the island of Leyte, 1 in Cebu City, 1 in Iloilo City, 1 on Guimaras, Panay. Practically all of these companies were occupied at some time during the year in restoring order in Leyte. There are also 5 companies of scouts on duty in Leyte, 3 of which soon go for station, I am informed, to Samar. This will leave 3 companies of scouts within the limits of this district, there being 1 company stationed now at Balamban on the west coast of Cebu.

SPECIAL EVENTS—PEACE CONDITIONS.

Antique.—The Province of Antique has been very quiet during the year, and while it is a very poor province, the general trend of agriculture and conditions generally has been distinctly for the better. One of the companies of constabulary was absent many months in Leyte, where it did excellent service.

On March 30 the ladrone band of Santos from the high mountains in the center of Panay made an attack on the isolated barrio of Pangalcagan, burning a number of *nipa* houses and a quantity of rice and kidnaping 9 prisoners, 8 of whom they killed on the trail afterwards. The band was pursued by constabulary from another town and overtaken the following day, when a slight engagement took place, in which some of the *ladrone*s were wounded, the band escaping, however, without much punishment, to the high mountains.

The people of Antique are, generally speaking, quite peaceable. The band of Santos is the principal disturbing factor. It consists of from 20 to 30 members and they are known to have 3 rifles and 1 revolver. They live in the mountain district near the center of the island, where they raise crops for their maintenance, occasionally descending for some raid into the lowlands. The raid above mentioned was in revenge for the death a couple of years ago of one of the sons of Santos, who was killed when trying to commit some robbery in that barrio.

One *Bitoc*, a native of Pandan, is supposed to be a ladrone chief with a small band in the mountains back of Pandan. He is not known to have firearms and no depredations have been committed by him during the year. He is apparently living with the mountain people. The third band is captained by one Juan Eugenio, and belongs in the vicinity of San Remigio. They are not known to have firearms and have committed no depredations during the year.

The principal thing Antique has to fear is a sudden attack on some of its interior towns from one of the several strong bands who inhabit the mountains on the Iloilo side of the border, and who can readily cross over in the dry season.

Bohol.—Bohol remains as ever very quiet and peaceable, its inhabitants enjoying great security of life and property. No constabulary have been maintained in Bohol during the year. It is the intention to place in the provincial capital 1 officer and a small detachment of 10 men to assist the governor principally in inspecting and instructing the municipal police of the several towns.

Capiz.—Peace conditions have been excellent in Capiz during the year, notwithstanding the fact that one of the constabulary companies was absent for a considerable period on detached duty due to the outbreak in Leyte. There seems to be still considerable stealing of carabao in some parts of Capiz. There seem to be no organized bands of armed ladrones in Capiz, although there are known to be a number of firearms in the mountains in the southern part that formerly belonged to a Tagalog revolutionary company that occupied Capiz before the American troops were sent there. It is thought that we will be able to take up these arms.

Cebu.—There can be no doubt of the statement that conditions in Cebu are better than they have been during the American occupation. The hard work and unceasing pursuit of the ladrone band captained by Quintin Tabal and his brother Anatolio, that have terrorized the central portion of Cebu many years, has borne good fruit through the instrumentality of Governor Sergio Osmeña, who induced the leaders to surrender to him, with all their arms and followers. Governor Osmeña has been untiring in his efforts for peace and good order. With the assistance of the constabulary he has been successful in ridding Cebu of all of the professional leaders.

The Tabal band has been cleaned up from the central part of Cebu. In the north, Petronillo Esnardo, a leader of considerable prestige, who was credited with being a powerful anting-anting man by the people, has been finally captured by the governor and his police and is now under sentence of life imprisonment.

Ruperto Caballero, another leader in the north, along the west coast, has also been captured through the efforts of the governor and is now under sentence of life imprisonment.

Through the efforts of Quintin Tabal, Agustin Pardines, the leader in the Naga country of the south of Cebu, has been captured and sentenced to imprisonment for a number of years.

One Cipriano Padlugdug was also captured, but made his escape from the municipal jail of Tuburan. A leader credited with some skill with the anting-anting, named Manuel Martinez, has also been recently captured by the police of Argao. In fact there are at present no organized bands of ladrones with arms in the island of Cebu. In the southern part of the island, however, there are several fugitives from justice who roam from village to village imposing on the ignorant country people. Effort is being made, with the assistance of the municipal police, to capture them.

The mountain people of Cebu are quite the same as the town people, i. e., Christianized Filipinos, who live back in the hills away from the towns, which are all on the coast. There is a feeling of great antagonism among the hill people toward the town people that if aroused and directed by a skillful leader, can be fanned into action almost any time. The people in the hills are densely ignorant and superstitious and claim that they receive no benefit from the taxes which they pay to the towns. The visits of Governor Osmeña to the various mountain barrios have done a great deal to alleviate the feeling, but there can be no doubt that it still exists to a considerable degree.

Iloilo.—Peace conditions are not altogether satisfactory. The principal disturbances during the year were the robbery of a train of carts, on February 8, en route to the Janulay market, of merchandise to the value of nearly ₱1,000. Most of the goods were recaptured by the constabulary, but the robbers made their escape to the high mountains. The barrio of Ambirijon, municipality of Tubungan, was attacked by armed ladrones in April, 4 people being killed, 10 houses burned, and 6 carabaos stolen by the thieves, who made their escape to the mountains. There has been a good deal of carabao stealing going on in the province also. In a number of cases the animals have been recovered by the constabulary and some of the thieves sent to prison. There have been several assassinations in the province during the year, chiefly due to gambling disputes or old family feuds.

There are said to be 8 bands of ladrones with firearms in Iloilo Province. I believe that ladroneism in Iloilo is of very long standing, has existed for many decades, and that its complete eradication will be a work of time. The principal outlaw bands are (1) the band of Sano and his brother Oto, who live in

the mountains in the northwest corner of the province, and who are supposed to have 4 military Krag rifles and 8 or 10 other firearms; (2) the band of Torriblo, who is a son-in-law of Sano, and somewhat under his jurisdiction. This band lives in the jurisdiction of the town of Leon, in the mountains to the westward. They are supposed to have 6 rifles and 1 revolver; (3) the band of Yde, also in the mountains to the west of Leon, is supposed to have 12 firearms.

The other bands in the province are not so important and are mostly somewhat under the control of the above influential ladrone leaders. They inhabit the foothills and make raids on the small villages in the lowlands to rob, or sneak through the country at night to pick up carabao.

The outlook this year is not any too good, because the locusts have eaten a great deal of the rice that the people have planted in the last three months. The railway under construction between Iloilo and Capiz, however, gives employment to a number of men, and with the coming of the dry season it is hoped will give employment to a greater number.

Leyte.—Leyte has been the scene of the principal disturbance in this district. The outbreak began there with the assault on June 19, 1907, on the town of Burauen, and continued throughout the year, having, just at the end of the fiscal year, been brought to a successful end. All the leaders have been captured except one, Felipe Idos, who is supposed to have only 1 revolver and no particular following. After the attack on Burauen the pulahan movement gained such strength that it was quickly seen that the movement was beyond the strength of the constabulary, and the regular troops were called upon. The troops arrived in July, just in time to save attacks by the pulahanes on several towns. On July 17, Lieutenant Williams, with a detachment of constabulary, successfully attacked a strong force of pulahanes, killing 1 and capturing a quantity of supplies. Four days later the same officer, with Lieutenant Worswick and an American scout, McBride, and 34 constabulary, were en route to attack the pulahanes about 2 miles from Burauen when they were rushed by about 200 with bolos and badly cut up. Lieutenants Worswick and McBride and 12 men were killed. This accession of 12 rifles immensely increased the pulahanes' strength, and on July 24, in the village of Tabon-tabon, there was a fierce encounter between the combined column consisting of 50 constabulary and 26 Regulars, under charge of Major Nevill of the constabulary and Captain McMasters of the army, and a force of some 450 pulahanes. Fifty pulahanes were killed in the fierce rushes they made on the troops, who were most skillfully handled by the officers. On August 9 a column of Regulars under Lieutenant James, Eighth Infantry, was attacked by the pulahanes at Julita, resulting in the death of Lieutenant James, Doctor Snyder, and a volunteer with the party, Internal-Revenue Agent Williams, and several soldiers. The pulahanes secured 3 Krag rifles and 3 revolvers. Lieutenant Treadwell of the scouts lost his life on September 10 in an attack by the pulahanes on his camp. On December 5 a combined column of 25 men of the constabulary, under Lieutenant Yates, and Company L, Eighth Infantry, under Captain Ham of that regiment was attacked near La Paz by a strong body of pulahanes, who were led with great fanaticism by Basillo Samson. Samson and 40 of his followers were killed, the troops losing 5 American soldiers and 3 rifles. Lieutenant Yates of the constabulary was severely wounded.

The result of this last encounter seems to have been the turning of the tide, and from that time on the people of the settled portion of the country, in the lowlands, apparently had enough of the pulahan movement, and the band withdrew to the mountains. On January 6 they were successfully attacked in their mountain trenches by a column under Captain Christman of the Sixteenth Infantry and Lieutenant Hemmett of the constabulary, assisted by volunteers from Dagami. Until May 21 there were no more encounters. On that date a small detachment of constabulary under Lieutenant Snodgrass of the constabulary, accompanied by 2 American soldiers, ran into a pulahan camp near Guinarona, the result being a severe wound for Lieutenant Snodgrass and the scattering of the pulahan body. From that day on they were rapidly picked up by troops or volunteers or surrendered with their rifles. On June 11 Lieutenant Jones of the Eighth Infantry, with a detachment of his company and a detachment of scouts, struck a group of 4 pulahanes who refused to halt and at whom he directed shots to be fired by 2 picked men. One of the pulahanes was wounded and captured and proved to be the famous leader, Faustino Ablin, styled by the common people "Papa" or "Pope" Faustino. This ended the campaign.

The work done by the troops in Leyte, under the various officers, was difficult and involved much hardship, as the mountain districts were most thoroughly patrolled and covered by detachments that remained days and weeks in the mountains, searching the most inaccessible corners. This skillful plan, so thoroughly executed by the troops, resulted in driving the pulahanes out of the mountains eventually to the lowlands, where they could be captured. The troops in Leyte under Colonel Smith, and the immediate commander at Burauen, Major Bell, not only performed most arduous service, under trying conditions, but the work was done with the least practicable disturbance of ordinary conditions and the least harm to the people. Mention should be made of the assistance of the people of Leyte themselves in capturing Faustino and his band. While no doubt their efforts were often without results and ineffective, yet the people, especially of the towns of Burauen, Dagami, Tanauan, on the east coast, and of Ormoc, Albueria and Baybay, on the west coast, turned out sometimes by hundreds and sometimes to the number of four or five thousand in all as volunteers. Several detachments of volunteers were regularly armed by the constabulary with firearms and maintained a semipermanent organization during the trouble, but most of the volunteers went out simply with their bolos and assisted in searching a certain country or in beating up the underbrush of a particular region. Many of them went to the mountains on expeditions for a number of days, suffering great hardships, due to the constant rains and to the roughness of the trails. The efforts of the provincial and municipal officials were of great assistance to the authorities and were cheerfully given.

The uprising in Leyte at its widest embraced only the minority of the people, affecting the central section, while the greater portion of the island, at the north and the south ends, remained tranquil throughout. There are some 34 municipalities in Leyte and at most only 8 were affected by this trouble.

The cause of the outbreak is difficult to determine. While the trouble seems to have had absolutely no connection with the pulahan movement in Samar, it was probably not unlike it in character. It was probably partly due to the great ignorance of the people living in the foothills, who were easily aroused by Faustino, and it doubtless represented the accumulated resentment of years of these country people against the town people, especially against the municipal authorities. No doubt a great factor was pure outlawry or the spirit of plunder, once the movement got well under way.

Faustino himself is a perfectly ignorant man, who can neither read nor write. He is 53 years old and a native of the outskirts of Ormoc. He is the youngest of a large family, and has himself 5 living children, 4 of whom have been with him in the hills. His wife is still with him and has shared his hardships in the mountains also. About 1887 or 1889 he was, by the Spanish authorities, arrested for having organized a fanatical movement known as the Dios-Dios movement. He was taken to the penal colony in Zamboanga, San Ramon, and also to Iligan and Marahui. In all he was absent some ten years, during which time his family lived in Ormoc. He says he was brought to Iloilo with a number of others about the time of the American occupation of Iloilo, and that he was sent to Negros, where the American authorities released him and allowed him to go home. He joined the insurrection then in progress in Leyte, and when the leaders finally surrendered in Leyte, he refused to come in, and has been an outlaw ever since.

In fact, Señor Jorge Kapili, of Leyte, who, with his column of 75 volunteers, remained in the field for a number of months, helping us last spring against Ablin, was the last of the leaders to surrender in Leyte several years ago, but apparently they could not induce Faustino to surrender. Faustino can give no intelligent idea of himself or of his plans, simply stating that he preferred to live in the hills, and giving various more or less incoherent accounts as to his religious or fanatical plans.

The campaign in Leyte wound up with a good deal of enthusiasm, and has, I think, left a minimum of bad feeling behind. All seem to be delighted that the trouble is over. Conditions there now are very quiet and efforts are being made to catch the remaining outlaw at large. The most harmonious relations existed between the army and the constabulary while they were working side by side. Much assistance was rendered the constabulary by the various army officers, and the senior inspector mentioned in his report especially the aid that was given them by General Lee, now retired; General Borden, now retired; Colonel Smith of the Eighth Infantry, Major Bell of the First Infantry, and a number of subordinate officers.

Negros Occidental.—Negros was very quiet during the year except for the startling outbreak, February 12 and 13, when the outlaw leader Isio, chief of the babaylanes, as the pulahanes in the mountains of Negros call themselves, burned a portion of the town of Suay and the principal part of the village of Cabancalan.

Early in the night of February 12 about 20 pulahanes entered the town of Suay and burned 24 houses and tried to spread the rumor that the entire province was rising in revolt. There was no constabulary in Suay, which is a small place. The band proceeded to Cabancalan, arriving early in the morning, by a circuitous route. There were 19 constabulary in Cabancalan, a corporal being in command. On receiving notice of the presence of the band in Suay, the corporal took 12 men and proceeded by the main road to Suay, but failed to meet the bandits en route. This left only 7 men in Cabancalan who, on the approach of the pulahanes, again made the mistake of dividing the force, 4 of the men going out to meet the pulahanes and 3 remaining in the quarters. The force, being without a leader, was too small to withstand the band, which had increased in strength to perhaps 100 persons with bolos and about 4 with rifles. The constabulary detachments were defeated in detail, the corporal in command being killed. The detachment that had gone to Suay returned on failing to meet the pulahanes and engaged them on the outskirts of Cabancalan, driving them back to the mountains.

The result of the raid as an attempt to create an uprising in Negros was a dismal failure because the people as a whole took no particular interest in it. Still it made a great deal of excitement among property holders and created an unsettled feeling.

The country affected by Isio and his band is the south-central portion of Negros. He lives in the densely wooded and rough mountains, and so far the numberless expeditions that have gone against him have been unable to get into his camp without his receiving warning in some way and escaping. He camps, of course, in inaccessible spots and uses the greatest precautions to prevent surprise, including many useful mechanical devices by means of which persons approaching are forced unconsciously to make a noise by setting off traps that roll stones down the mountains or that fling spears at themselves. Isio has undoubtedly lost prestige in Negros and we have been able in the last few months to get in touch with hundreds of the mountain men who have pledged themselves to assist us in capturing him. These people were once his sympathizers and subjects. This I regard as a distinct step in advance, because we need the assistance of the mountain people in order to capture an outlaw like Isio.

The following interesting extract is here inserted from the annual report of the senior inspector of Negros, Capt. George B. Bowers, as giving a very clear description of such an organization as Isio's band and a clear idea of the different classes of people that inhabit Negros and many other provinces:

BABAYLAN OR PULAHAN.

From time immemorial there has existed an organization known as babaylanes. This was merely the protest of the wild against the new order brought about by civilization. It used religion as its base, not religion in the commonly accepted term, but that conglomeration of ignorance and superstition in which some one comes forward and by his cunning and deceit appoints himself a god, a pope, priest, or some other, meaning leadership, authority, or power.

During the Spanish régime there were many gods, popes, and chiefs. If one was killed or captured there was always another to take his place. When the Spanish Government capitulated to the revolutionary there was one of this long line with which the insurgents were compelled to treat and to conciliate. This was Dionisio Magbuela, who now styles himself Dionisio Papa. He now has a band consisting of about 15 active followers, the principals being Juan Mayo, Marcelo Tuyó, Eugenio Alcachufas, and Eugenio Tolatola. Dionisio Magbuela, commonly known as Dionisio Papa, or Papa Isio, is a man of about 65 years. When yet a boy his father brought him with the rest of his family from Panay to Himamaylan, Negros, where the father established a small farm in the foothills. Here they lived until a landlord ordered them to move. This the family did, going to Payao, where the father and mother died and the family was broken up. There then was left but 2 brothers, Dionisio and Cris-tomo. All this happened at least 40 years ago.

While living in Payao, Dionisio was employed as a tuba carrier. In about 1880 he went to Isabela where he became herder for the Montilla family. He

lived in the vicinity of Magallon and herded the cattle on the large cogon plains near that place. Soon after this he became involved in a quarrel with a Spaniard near La Castellana, which resulted in the wounding of the Spaniard and Islo's flight to the mountains. Some time previous to this a celebrated chief named Baraua Dios had been killed. The time was ripe for another leader. Islo announced himself as "Pope." He was accepted by the people in the mountains as their leader. He erected rude churches, baptized, performed marriages, blessed his followers, and deceived them by selling them charms or "anting-antings." In this manner he came to have great prestige with the people of the mountains and the laboring class in the lowlands.

Up to the year 1896 the babaylanes confined their operations to the mountain district and did not pretend to have a political character. But in this year began the agitation against the Spanish government. Islo decided to take a part. He made his first attack in the lowlands at Magallon. Here the guardia civil overtook his force and killed more than 50. This was the beginning. They next appeared near Cabancalan, where several hundred were killed. As the country was ripe for insurrection the inhabitants did not look upon this as outlawry, but as a legitimate manifestation of the outraged public. This secret encouragement had the effect of so increasing the number of adherents as to include almost 90 per cent of the inhabitants of the southern half of the province. They no longer called themselves babaylanes but pulahanes, or insurgents. The directors of the insurrection of 1898 had used this as a means to enlist the lower class in the revolution.

In 1898 the Spanish turned over the government to the insurgents. Islo at the head of his horde was a menace to the newly organized government. The leaders decided to use a policy of attraction. He was invited to Bacolod, where he was wine and dined. He was received in and visited the homes of the best people. He drove in uniform with the governor of the province and dined with the president of the republic of Negros. He was received as a visiting potentate. On leaving Bacolod he carried with him a commission as military chief of La Castellana, relieving an educated half caste, who, in turn, was appointed to a subordinate position. Here he increased his power, as this recognition gave him greater prestige. The educated class considered this an outrage. Islo began to talk of proclaiming himself governor or president. His followers numbered many thousands. The officials of the government began to fear that he would establish a plebiscite in which would reign anarchy. A commission was sent to invite American protection. This was done in 1899. Immediately Islo and his people declared themselves enemies and began a campaign of murder, arson, and rapine. It is not strange that after such a display of power that the thousands who followed him yet retain a feeling of awe that prevents them from going into, with heart and soul, any scheme which might result in the death of him who had shared with them the hardships of the past.

Since 1900 to the present time Islo has been in the mountains. At least once each year his forces with fanatic zeal attack some part of the province. In 1901 he entered Payao and burned it to the ground and killed a number of people.

In 1902 they killed a number of scouts and volunteers near Himamaylan.

In 1903 they changed to the vicinity of Murcia, where they were engaged by Captain White, and one of the leaders, Dalmacio, was captured.

In 1904 La Carlota was the field of action. The farm of a Spaniard was attacked and sacked. Several prisoners were taken to the mountains; one, the brother of Lieutenant Guaso, was killed by them.

In 1905 they entered Isabela and occupied the town for several hours, but the timely arrival of the constabulary prevented the burning of the town.

In 1905 it was supposed that Islo had been killed. That has since proved a mistake. The person who had been recognized as Islo was one Rafael Agosto.

In 1906 the constabulary was kept exceptionally active and there were no raids of importance. During the first months of the year Islo moved his camp to the hills near Canlaon, where he was attacked by Sergt. Ledesma and defeated. They lost several arms and men. In 1907 was the attack on Cabancalan.

Marcelo Tuyo is a native of Antique. He is a man of about 55 years. About fifteen years ago he came to Himamaylan and worked as an engineer in a hacienda of an Englishman. In 1896 he entered the ranks of the pulahanes as a general. In 1901 he surrendered and lived in Isabela. Three years afterward he became involved in a sugar steal and to escape punishment went to the pulahanes again. He is a man of the lower class, but far more intelligent than the average. He does not speak Spanish fluently, but can understand it.

Juan Muyo is a native of Antique, about 50 years of age. He is said to belong to the middle class. He speaks, reads, and writes Spanish. He came to Negros about twenty years ago as a foreman of laborers, working on the farms. Some time after the revolution he became manager of one of the haciendas of Carlos Gorrea, a mestizo of La Carlota, where he worked several years; to be exact, until 1903. This ended with a dispute about the profits in which Muyo considered himself the injured party. He swore vengeance and joined Isio. This was a great surprise to the people of La Carlota, as he had always borne a good reputation and was considered a trustworthy and honest man. He is the best educated man of the band.

Eugenio Alcachufas, a native of Cebu, is about 50 years of age. Little is known of his past history except that he has been with Isio for the past three years. It is said that he commanded the attack on Lieutenant Walker, Philippines Constabulary, in Cebu a few years ago. In that fight the lieutenant was killed. Spies report him to be one of the most important chiefs and a favorite of Isio.

Eugenio Tolatola, of Himamaylan, is about 50 years of age. He has been with Isio since the revolution. Formerly he was a private in the guardia civil and a sargento of Cuadrilleros.

These men are the leaders of the present pulahan organization. They are armed with 5 rifles and 2 revolvers. These are reported as being 1 Mauser, 1 Springfield carbine, 1 Springfield rifle, 2 Remington rifles, 1 Colt's revolver, and 1 small bulldog revolver. Their supply of cartridges does not exceed 25.

The provincial and municipal authorities in Negros are doing everything to help, and with their assistance results are hoped for.

Negros Oriental.—Negros Oriental remains as usual very quiet, there being little or no outlawry or disturbance. Its people are naturally threatened, though not to such an extent as the western part of the island, by the existence of Isio in the hills. The authorities of this province are all assisting in the efforts being made now to capture Isio.

RELIGIOUS AND POLITICAL CONDITIONS.

Religious strife does not seem to have disturbed the peace of any part of the district during the year. There is rivalry no doubt, but it does not stir the passions that were aroused a few years ago. The senior inspector of western Negros remarks that "the people have 'cooled' down. Now one seldom hears anyone mention those questions, 'Friar lands,' 'Aglipay,' etc., which at one time were favorite topics of conversation."

In Antique there are many Aglipayans, while in Negros they are also strong. In Cebu the only Aglipayan church is one at Jagnaya. In Iloilo there are a number of Aglipayans, also in Romblon. Cebu, Bohol, and Leyte have, practically none, and I think there are few, if any, lawsuits over church property pending in these provinces.

There are a number of suits pending, however, in the supreme court over churches, cemeteries, parish houses, and similar property in the several provinces on Romblon, Negros, and Panay islands. There are 13 in Iloilo, 37 in the whole of Negros, 13 in Antique, and 8 in Romblon.

Much political interest is manifested over the elections for assembly in the larger towns, though the mass of the people take as a whole little interest in political affairs. While the rivalry between candidates is keen, nothing to affect the public peace has occurred. Except in the larger towns party lines are not drawn, nor are parties even organized after the lines of the Manila parties, but are formed rather on personal or family associations.

MUNICIPAL POLICE.

Efforts are being made to improve the condition of the municipal police by assisting the village authorities in their instruction and by more frequent inspections of the condition of the police and the condition of their arms. The district is so short of officers that we can not do much yet, but the senior inspectors are doing all they can and taking much interest in assisting the police. One great drawback to the efficiency of the police is section 26 of act No. 82, which makes the term of the police end when the president's term expires. The law should be amended to except the police from the operation of the paragraph requiring them to be engaged for periods of two years by the councils.

WILD TRIBES.

There are Negritos in small numbers in Antique, Iloilo, and Negros. Montescos, or uncivilized Filipinos, are found in considerable numbers in the mountains of Antique, Capiz, Iloilo, and Negros. In Cebu, Bohol, and Leyte there are no wild tribes, the inhabitants being all Christianized people.

As in other parts of the archipelago, the efforts of the constabulary are so much taken up in protecting the people of the villages that there is not sufficient force to occupy the hills and to control and protect the wild tribes.

When the time comes that the village police are able to do more toward protecting life and property in the lowlands, the constabulary can move to the hills and control and take care of the mountain people and prevent the mountains from being a resort and a recruiting ground for criminals from the lowlands.

Excellent work is done by the constabulary hill stations in Cebu, Ormoc, and Leyte, and it is a matter of regret that they have not more of them.

In the outbreak in Leyte several years ago the barrio of Dolores, in the foothills above Ormoc, was deeply involved and the scene of conflict. During the recent outbreak that barrio went on and tilled its fields, made hemp, and paid no attention, although Faustino is a native of a neighboring barrio of the same town of Ormoc and at the beginning had more than a hundred Ormoc people with him. The reason was that Dolores had become settled down since the establishment of the constabulary station there, and the people, knowing the pulahanes could not enter and molest them, were glad to be out of it all. Another mountain camp above Ormoc, but to the south, has been established on the slopes of Mount Mahilaom, outside of barrios that are now being rebuilt by their inhabitants who became scattered during the struggles.

CONSTABULARY ORGANIZATION AND EQUIPMENT.

The constabulary of the district is in good condition, the receipt of a portion of the new rifles being the greatest improvement. The Krag-Jørgensen carbine of the army fitted with a longer stock and with the Krag infantry rifle bayonet makes an ideal gun for the brush.

Several matters thought desirable for the organization have been suggested to the director in special reports from time to time.

RECOMMENDATIONS.

There can, I think, be no doubt that life and property in this part of the archipelago are better protected, and that peace conditions are much improved year by year.

The great drawback is the lack of means of communication from town to town by roads, bridges, and telephones.

The amalgamation of the towns by which the number was reduced by the Commission in 1903, seems to have fallen rather heavily on some of the provinces, especially on Iloilo, where the report of the governor-general (p. 83, Vol. I, Report of the Commission, 1903), for the year shows the number of towns to have been reduced from 51 to 17. Heavy reductions were made in Western Negros also—34 to 21.

It would be a useful and wise measure to secure the appointment by the governor-general of a special committee to inquire and report as to whether the expectation hoped for from the consolidation has been realized and whether some of the towns should not have their individuality restored.

Such a committee could well consider the subject of the practicability of the appointment of delegates, or subgovernors of some sort, to supervise, protect, and represent, as it were, the hill peoples of Leyte, Cebu, Negros, Antique, Capiz, and Iloilo, and to outline the powers and duties of such officials. The municipal governments could hardly be expected to perform the functions needed to care for the mountain peoples, who under the present division of territory are all within the jurisdiction of some municipality.

These two subjects will be found, I am confident, to have the very closest relation to matters of peace and good order in the provinces concerned.

Great harmony has existed between the constabulary and the provincial and municipal authorities whose assistance is much appreciated. The relations between the constabulary and the people are also excellent.^a

Very respectfully,

W. C. RIVERS,
District Director.

The EXECUTIVE INSPECTOR, BUREAU OF CONSTABULARY,
Manila, P. I.

REPORT OF THE DISTRICT DIRECTOR, FOURTH DISTRICT.

FOURTH CONSTABULARY DISTRICT,
OFFICE OF DISTRICT INSPECTOR,
Vigan, P. I., July 1, 1907.

SIR: I have the honor to submit the following report of the fourth constabulary district for the fiscal year ended June 30, 1907.

PEACE CONDITIONS.

The peace conditions in the fourth district, taken as a whole, are very satisfactory. There are no organized bands operating in any of the provinces. The only attempt of this character was made in Ilocos Norte, but through the zeal of the governor of that province was quickly squelched.

The maintenance of peace is afforded the people by devoting the constabulary to the suppression of crimes against the person, the destruction of the large cattle-stealing traffic, the discouraging of raids on the part of the non-Christians against the farmer in isolated localities, the bringing of our moral influence to bear on the non-Christians to recognize the law, by affording protection to the life, liberty, and property of non-Christians in neighboring rancherias, and by encouraging friendly relations among all the rancherias which have been at enmity with each other, so that their future dealings may be without fear of the treacherous spear or head ax.

RELIGIOUS CONDITIONS.

The religious conditions in this district are such as to give not the slightest cause for alarm, in contradistinction to the state of affairs that seemed to exist three or four years ago. The differences of opinion on this subject are of such long standing with the people that they have become accustomed to it, and a spirit of tolerance now prevails everywhere.

POLITICAL CONDITIONS.

The political conditions of this district with but a few exceptions are extremely quiet, the people in general not being specially interested in the coming elections for representatives to the Assembly. The interest in these elections seems to be confined practically to the various candidates and their immediate followers. The general impression seems to prevail that the elections for these offices are of minor importance and not to be considered with those for presidents. While there are, in some cases, strong efforts on the part of the candidates to awaken among the people an interest in their respective merits, the casual observer while traveling through the provinces, unless seeking light on the subject, would have difficulty in discerning any symptoms of our being on the eve of an election.

ECONOMIC CONDITIONS.

With the possible exception of Cagayan, the economic conditions are gratifying, as evidenced by the general spirit of contentment that seems to prevail in all the provinces. A noticeable feature is the erection of new buildings and

^a A number of tables showing number of arms captured, animals recovered, engagements, casualties among constabulary and outlaws, and operation of the municipal police have been omitted and are on file in the Bureau of Insular Affairs, War Department.

the repairing of old ones, as well as the cultivation of untilled lands or land neglected for many years.

All along the coast may be observed the keen interest that the people are taking in the cultivation of maguey. Even in some of the mountain sections this industry is awakening a lively interest in anticipation of obtaining machinery for the purpose of stripping the plants, in lieu of the salt-water process now used. This zeal is brought about by the high price for which maguey has been sold this year, namely, from 10 to 14 pesos a picul. Aside from this fact the maguey plant suffers neither from langostas nor drought. In the promotion of the maguey industry the other natural products of the provinces have by no means been forgotten. On the contrary, they have been pushed to such an extent that in nearly all the provinces the production has been a banner one. With the closing of the vacation period and the opening of the schools, a further evidence of the general thrift and prosperity is given by the neat appearance and dress of those attending; all are dressed neatly and with a comfort that but a few years ago was noticeably absent.

CONSTABULARY.

The efficiency of the constabulary of this district is very good, but their number is entirely inadequate, both in officers and men, for the work that is expected of them. The element of time has possibly had a different effect on conditions and affairs in this district than on the districts in other parts of the archipelago. Having a large population of non-Christians, and in every province a great area of country capable of development, the elimination of the ladrone bands has brought out the suggestion of extending the benefits of civilization among the non-Christians by the establishing of constabulary stations in their midst.

This not only affords them greater security against neighboring tribes, but also opens up the country to ambitious Filipinos, by affording them protection in their agricultural pursuits, as well as to the "traveling comerciante." This matter has been given considerable attention in the province of Lepanto-Bontoc and is now being taken up in Cagayan, Isabela, Ilocos Norte, and Abra.

The establishing of two additional subprovinces in this district—one in Lepanto-Bontoc and the other in Cagayan—necessarily calls for more troops in order that the purposes of the government may be materially advanced. To do this requires more officers and men. As it is, the demands made on the constabulary throughout the different provinces, for the protection of people working in the fields against the barbarities of these non-Christians, are such that it is impossible to begin to comply with them. While there are only 6 provinces in this district, there are also 5 subprovinces to be taken care of, all of which, by reason of the delicacy of the work to be handled, should be officered by men of experience, capable of cooperating with the lieutenant-governors of their respective subprovinces. Moreover, in dealing with the non-Christian, the arms with which the government has intrusted us are only to be used when every other possible means has failed. This in itself requires that the men placed over the detachments in non-Christian provinces be men of judgment and tact, that the work and desires of the honorable secretary of the interior may be carried out.

There is not one of the provinces that does not suffer from raids made on the Christian settlements by these non-Christians, and naturally the fear is such that much land belonging to Christians located in those localities is untilled and neglected. If the constabulary is expected to do anything, it should certainly afford these people the necessary protection, and be provided with the means to do it.

In carrying out this work among the non-Christians the progress has been somewhat retarded from the fact that Nueva Vizcaya is in another district and that the district director is not in as close touch with the policy of the provincial governor of that province as he otherwise would be. The constant friction that arises between the outlying or boundary rancherías—that is, those bordering on Lepanto-Bontoc, Nueva Vizcaya, Isabela, and Cagayan—has been such that while long on letter writing we have been short in results. These people are constantly at war, and any feuds arising from their head-hunting practices that require to be settled are more difficult to handle on account of having to be done through separate districts. With a view to overcoming this

difficulty I would suggest the changing of Nueva Vizcaya into the fourth district, renewing the recommendation I made over two years ago in one of my reports.^a

SUBSISTENCE.

The question of subsisting detachments stationed in non-Christian localities is at times a serious one, owing to the lack of supplies obtainable where many of the detachments are stationed. The transportation of supplies during the rainy season over mountain trails and swollen rivers is not only difficult but dangerous for the cargadores, so that at times it is almost impossible to obtain them to transport enough supplies to exist on. In consequence of this condition of affairs it has been necessary to authorize the detachment at Tault, Apayao, to purchase six months' supplies, paying therefor one-sixth monthly. It may be necessary to have the same arrangement at Maunanan, Tabuc, and Mayayao, as not even rice can be purchased at any of these stations. Aside from these difficulties, frequent demands for cargadoring among the Igorots or Calingas cause constant irritation, thereby adding obstacles to the successful influence of the station commander over these people. With the exception of the above stations, the subsistence of the troops is ordinarily very satisfactory, all of them being able to amply supply themselves with good, substantial food, and incidentally have sufficient savings to add to their material comfort and recreation.

CLOTHING.

In nearly all cases the men have been able to clothe themselves well on their clothing allowance. It is believed from observation that the large amount of money that many of the men draw on final statements is not due to the clothing allowance being too large, but rather to their practice of having their uniforms made by the local tailors. The present system appears to be entirely satisfactory.

ARMS.

The first company, constabulary of Ilocos Sur, and the first company, constabulary of Isabela, have been armed with the new remodeled Krag carbine within the last few months. With the exception of these two companies, the constabulary of this district are all armed with the old Springfield carbine, caliber .45. These arms are not only obsolete, but a large number are unfit for service. This was clearly shown in the course of range practice which was held in this district during the months of May and June. Several companies have shipped all their old guns to the ordnance officer and been supplied with new ones, but even these would not give satisfactory service in case any emergency should arise requiring the use of an effective weapon. From the short time that the new remodeled Krag has been in this district, it can be clearly seen that it is the most suitable weapon for the native soldier that can be obtained, and the bayonet makes it a particularly effective weapon.

BUILDINGS.

Buildings owned by the government are being used as barracks at the following places: Laoag, Ilocos Norte; Bangued, Ilocos Sur; Candon, Ilocos Sur; Ilagan, Isabela; Cervantes, Lepanto-Bontoc; Bontoc, Lepanto-Bontoc; Lubuagan, Lepanto-Bontoc; and Balbalasan, Lepanto-Bontoc. The buildings at Ilagan, Isabela, and Cervantes, Lepanto-Bontoc, used as civil supply stores, are also owned by the government. These buildings are all in a good state of repair and are entirely suitable to our needs.

TRANSPORTATION.

From the records showing the transportation furnished the several provinces, it would appear to be ample for all purposes, but an inspection demonstrates the antiquity of the live stock and their uselessness in any extended campaign. Most of the horses in this district were turned over to the constabulary by

^a Table showing the results of operations during the period covered by this report has been omitted and is on file in the Bureau of Insular Affairs, War Department.

the army in 1901 and have been doing duty ever since. Ordinarily the work of the constabulary horses over the mountain trails is such that if extraordinary care is not taken of them they quickly break down. There is no doubt but that some of the horses now used in this district, and which are considered practically unserviceable, could give good service in a country less broken than that found here. As it is, many of them are too old and practically not worth their forage for mountain work. We should have good, strong, live horses, either native or Australian, and it is believed that if this class of animals be furnished, it would be more economical, as the means of saving a great deal of time and expense, especially to officers making their inspection and pay trips.

MUNICIPAL POLICE.

The municipal police throughout the district, by their cooperation with the constabulary, are in general doing very satisfactory work, and in nearly all the provinces where they are under the supervision of the senior inspector are gradually assuming the semblance of an effective organization. Efforts are being constantly made to impress the constabulary officers throughout the district with the wisdom of interesting the provincial and municipal authorities in having an effective police force, capable of cooperating with the constabulary in the maintenance of peace and security, and the necessity of keeping the senior inspector advised of all crimes committed, so that he may get all the police forces throughout the province at work with the constabulary toward effecting the capture of the criminal, when at large, or the recovery of animals and other property lost, strayed, or stolen. The results have been gratifying, and in most instances the earnestness with which the police have entered into the spirit of their work has been exemplary. There are yet some exceptions to the rule in this respect, due to the reduction in the police forces and the cutting down of their salaries for economic reasons, but it is hoped that this difficulty will be soon overcome.

Monthly inspections of the municipal police are made and the local presidents consulted as to ways and means to obtain the best results.^a

CONDITIONS IN THE PROVINCES.

CAGAYAN.

During the past year the conditions as to peace have been good. While there are no outlaw organizations in this province, there is considerable carabao stealing going on. Even at this writing a report has just come of 7 carabao having been stolen in the town of Enrile. Everything possible is being done to suppress this evil by persistent work on the part of the constabulary and local police.

The internal-revenue agents have also met with more or less trouble in enforcing the law among vino distillers. The zeal with which they have carried out orders in the seizure and destruction of stills has been the source of much ill-feeling, particularly among those who have not complied with the law through lack of funds. In the prosecution of this work one native gauger was, on August 18, 1906, attacked near Abulug and severely beaten by 7 men, who also robbed him of his money, papers, and revolver. The revolver was recovered and the men captured by Lieutenant McIntyre, who commands the constabulary station at Abulug.

On April 9, 1907, Revenue Agent Wright, while engaged in taking an inventory of the vino on hand and the names of the working force of an illicit still which he located in the nipa swamps between Pamplona and Abulug, was suddenly attacked from behind by some one with a bolo and cut severely about the face, the cut running from the right forehead to the left cheek bone, destroying the left eye. Wright managed to draw his revolver and fired two shots, but, being blinded with blood, hit no one, managing only to frighten his assailants away, when he then fainted. The pilot of Wright's boat was also wounded, but not seriously. The latter returned to the boat and, securing the assistance of the crew, returned and carried Wright to the boat and brought him to Abulug. Lieutenant McIntyre, after notifying his senior inspector,

^a Table showing the strength of the municipal police of this district by provinces has been omitted and is on file in the Bureau of Insular Affairs, War Department.

started in pursuit of the assailants. The acting senior inspector, Lieutenant Clark, arriving on the scene, took charge of affairs, and succeeded in capturing the assailant who it is alleged committed the deadly assault. The other 5 associates through the influence of the padre of Pamplona, later surrendered to Lieutenant McIntyre.

The senior inspector reports much suffering among many of the poor people thrown out of employment by the destruction of these stills. In spite of the blighting effect on the vino industry, however, one modern vino still has begun work at Linao, and two more will soon be ready to operate in Pamplona.

In addition to the suppressing of crime throughout the Christianized portion of the province, many expeditions were made into the Calinga country for the purpose of establishing peace relations with the head-hunters. On one of these expeditions Lieutenant Greene with his detachment met with many difficulties in crossing the rushing mountain streams. Small streams, almost dry on going, would be filled from bank to bank on the return trip. On this trip Sergeant Taguba, while crossing the Chico River, was thrown from his horse by the strong current and drowned.

The latter part of July, 1906, Colonel Crawford, district director, Captain Knauber, senior inspector, and Lieutenant McIntyre and 7 men went on a peace expedition into the Apayao country. Many of the rancherias were disposed to be hostile, but in general peaceful relations were established. While descending the Abulug River on rafts, at the mercy of its rocks and torrents, Lieutenant McIntyre was thrown from his raft and narrowly escaped drowning. During this time Colonel Crawford and Captain Knauber were attacked. Lieutenant McIntyre being finally able to come to their assistance, the assailants were at last routed. Both Colonel Crawford and Captain Knauber were slightly wounded. The loss of the assailants is unknown. February 25, 1907, another expedition was made by Colonel Crawford, Captain Knauber, and Lieutenants Guild, McIntyre, and Hanlon, with 30 men, into the Apayao country of western Cagayan for the purpose of making a tour of inspection, peace-making, map correcting, etc. On this expedition many rancherias were visited and peace relations established, but on reaching Ganed, the rancheria that had attacked them on their previous expedition, another fight occurred in which the Calingas were routed and all houses burned.

Details of this expedition are fully covered in Colonel Crawford's report rendered the executive inspector under date of March 14, 1907.

There is no province in this district that has suffered during the fiscal year as has Cagayan. First, a severe bagulo struck the province September 18, 1906. It was especially severe in the northern part. In Aparri 200 houses were blown down; Gattaran, Alcala, Amulong, and Buguey were almost wiped out, and all communications cut off; tobacco in bales, bundles, and packages were floating down the river for four days; all barangayes that happened to be in the river were lost, and two launches were also sunk. It is estimated that the loss incurred reached ₱4,000,000, but so far as known only 9 lives were lost. Following the bagulo there were many severe cases of sickness, in which a large number of the native inhabitants and Europeans were attacked with dysentery, resulting in many deaths. About the middle of November, on account of heavy rains, the Cagayan River and its tributaries rose to a height never before experienced by the oldest inhabitant. The towns along the river were entirely under water and a large number of houses were swept away; the loss of carabao, horses, and hogs was immense; all crops which had been planted were washed out; tobacco, food supplies, and seeds for the next year's crop were in many cases destroyed. Some of the people of Alcala reported counting over 300 houses floating past that town, most of them having people on top and in some cases inside on the rafters, calmly floating down the river to the sea. Fortunately nearly all were saved.

In Abulug the Abulug River rose to such a height as to menace the town. The presidente, who was unable to cope with the situation, turned over the town to Lieutenant McIntyre, the constabulary station commander in Abulug. The lieutenant, with his detachment, roused the people from their lethargy and compelled them to take a hand in saving the public buildings and property by removing them from the danger point. The safety of this property being assured, the people, roused by the example set them, proceeded to save their own property, so that the loss was comparatively small. The rise of the river was so great that it cut off and carried away over a hundred feet of land on which many houses had been built.

The province has since been struggling to overcome the misfortunes of 1906 and has been bending every effort to avoid any possible distress among the people. While there will no doubt be some suffering among the people in localities affected by the destruction made by the river, in general most of the people are inclined to take an optimistic view. That part of the province not affected by the flood will have a good healthy production of tobacco and other food supplies, and there is a feeling of contentment which is especially marked in comparison with the condition of their less fortunate neighbors who suffered from the caprice of the Cagayan River.

Religious and political.—At present there is very little friction between the religious organizations. During the month of May it was thought that there might be some trouble between the Catholics and the Aglipayanos at the fiesta of Santa Cruz (a barrio, part of which belongs to Aparri, and part to Abulug), owing to both factions holding separate celebrations, but happily everything passed off very harmoniously. Politically everything is quiet, the coming election for the Assembly seeming not to interest the people very much. Only one or two candidates in each district have announced themselves, and as they are only known locally, not much interest is felt throughout the province.

Ex-Governor Guzman is a candidate for the first district, and his election is conceded. In the second district there are several candidates, one of whom is an American negro named William Hawkins, an ex-captain of volunteers, who has large interests in the Itaves district and now resides in Plat. For the autumn election it is understood that there are to be several candidates for both governor and third member, but so far none have publicly announced their candidacy.

Scouts.—One company of scouts, the Twenty-eighth, arrived at Aparri last March for the purpose of obtaining recruits, and are at present doing duty at that town. Their relations with the people and the constabulary are extremely amicable, and their presence is appreciated by the comerciantes on account of their bringing considerable money into the town.

Municipal police.—The municipal police, owing to the reduction of their strength from 212 to 130, have during the past year been more or less demoralized, but are now slowly recovering and the results obtained from their service are fairly satisfactory, considering their strength. In most cases the local police are poorly paid, and to enable them to exist they are obliged to have some outside source of income. At present there seems to be no remedy for this, owing to the inability of the towns to raise sufficient funds, but by persistent effort we hope to raise the standard of efficiency, even with the present reduced strength, to what we obtained under the old strength.

ILOCOS NORTE.

This province is at present in good condition as regards peace. An attempt was made last August to organize an unlawful band under the leadership of Valentin Butardo, but with the assistance of the wide-awake governor the matter was nipped in the bud. One hundred arrests, including Butardo, were made, thereby putting a quietus on the movement.

Carabao thieving still continues and while the thieves are being rounded up by the constabulary and local police, they so far have failed to eliminate the abuse.

A source of annoyance has been the desultory attacks, with murderous intention, made by the non-Christians on people working in the fields in outlying barrios. An effort is being made to cover the mountain sections by patrols so as to afford people there the necessary protection.

As to the prosperity of the province, there is no doubt but that the people are very much contented. The crops have been exceptionally large, the only possible exception being in the extreme north, but even there contentment seems to prevail.

Religious and political.—The church property question between the Catholics and the Aglipayanos is a subject of adjudication at present. Evidence is now being introduced by both sides in support of their separate contentions, and the discussion with reference to the question has been such that gives no doubt but what the matter will be settled amicably. With reference to the coming election, the people are too busy with material affairs, and the interest is practically confined to the candidates and their immediate followers. As the time for the election approaches however, efforts are being made to stimulate this interest among the people.

Scouts.—There are no scouts or other military organization in this province.

Municipal police.—Regular inspections of the municipal police have been made during the year, and in the majority of cases they have been found to be fairly efficient. The cooperation of the police force with the constabulary has not been all that could be desired. This I do not believe was due to any diffidence on their part, but rather from lack of proper instruction as to how far their cooperation with the constabulary should extend. It is hoped that this condition will be largely improved, and the constabulary and municipal police so work in unison that the pernicious traffic of the carabao thief will be suppressed.

ILOCOS SUR-ABRA.

The conditions are good, in fact the past year is claimed to be the most prosperous in its history. The production of maguey, and the price obtained, has been far beyond the wildest dreams of the producer. Great efforts are being made to extend the cultivation of this plant, not only in Ilocos Sur but also in Ilocos Norte.

During the past year, Vigan shipped to Manila 16,369 quintales maguey, 63 quintales afil (indigo), 499 quintales tobacco, and 5,000 piculs sugar.

The people are without doubt contented, and evidence of their prosperity can be seen in the improvements being made in their homes, the erection of new buildings, and the neat and dressy appearance of the boys and girls attending school.

Even Abra, that has practically been dead so far as any evidence could be seen of their trying to recover from the effects of the insurrection, is now waking up and preparing to put on new clothes by the erection of new buildings. They have had there an excellent crop of tobacco, corn, and palay.

Having no organized band of ladrones, a spirit of tranquillity prevails. Were it not for the pernicious thefts of carabao, an abuse that still continues, and the feeling of insecurity in the outlying barrios of Abra against attacks of the head hunters, there would be little to do but look after the usual crimes committed everywhere.

Political and religious.—The religious conditions are very satisfactory, all of the different religious schisms following their respective beliefs without the use of any violence whatever. Whatever differences there may be extend no further than in a large expenditure of words. The political situation is quiet, although the various candidates for the Assembly are working tooth and nail to gain supremacy at the coming election. The people in general, however, do not seem to be very much interested. The only one of the three districts in which there is the least contest is the second or southern half of Ilocos Sur. The arrangement of "fences" for the election for governor and third member is going merrily along, and there is a great deal of rivalry at present between the presidente of Vigan, who is a candidate for the former office, and the present incumbent. This rivalry at times is such that the feeling between the candidates savors somewhat of a personal character, and a hot campaign is looked forward to as the time for election approaches.

Scouts.—There are no scouts or other military organization in this province.

Municipal police.—The municipal police are in general doing good work, but the pay is too small to attract efficient men, the average pay being only ₱7. The fallacy of having a poorly paid protective force was shown in the towns of Cabuagao, Bangued, and Danglas, where it was shown that attempts had been made to rob the municipal treasury and that these attempts were traced to the municipal police. The senior inspector is endeavoring to increase their efficiency and incidentally prevails on the municipal authorities to the extent of raising the standard by holding out the inducement of a higher salary. Regular monthly inspections are made, and so far as their equipment and personal appearance are concerned, they are very good.

ISABELA.

The present conditions are unusually quiet. No outlaw organizations are known to exist. During the year there has been considerable carabao stealing, but this abuse has been very materially diminished. As this carabao stealing was carried on to a great extent on the border line between Isabela and Cagayan, and was believed to be with the connivance of certain municipal officials, a detachment was stationed at San Isidro, Isabela. By the making of a few

arrests and patrolling the affected districts, the desired moral effect has been obtained, so that carabao stealing is now an exception rather than the rule, as formerly.

The bagulo of September 18, 1906, which played such havoc in the Province of Cagayan, also caused great destruction in Isabela, the Tabacalera Company, Weber Brothers, and Don Manuel Nieto being the heaviest losers. All tobacco and corn from Echague to Cauayan was lost. Many houses were destroyed and animals lost. Only by herculean efforts on the part of the constabulary and provincial government were the people of the lower valley saved from starvation. Hardly had the people recovered from the effect of this disaster when they were again visited by a more terrific storm. The Cagayan River submerging the surrounding country and causing immense destruction to the tobacco interests almost brought the people to the verge of starvation, which would have been inevitable had not the province distributed rice among the sufferers.

About this time an expedition under the command of the senior inspector, Captain Poggi, went into the Mayayao country, with a view to preventing a head hunting expedition into Nueva Vizcaya. In this they were forestalled by the Igorots of Mayayao, who had already gone and secured the required number of heads. While returning from this expedition the larger portion of the command under Lieutenant Crockett were caught on the other side of the Magat River, which had risen to an unusual height by the unprecedented floods which devastated the entire valley at the time. In this predicament they were obliged to remain three days without food, all effort to relieve their situation from the outside and by themselves having proved unavailing. Five lives were lost, 2 constabulary soldiers and 3 cargadores. These men volunteered to make the attempt of crossing the river in search of food, only to be swept under the treacherous current and dashed against the rocks below. No trace of the bodies has ever been found.

Another expedition was taken in January into the Mayayao country under command of Captain Olson. The object of this was similar to the one previously made, i. e., to prevent Mayayao from making a punitive expedition against Allmit, a rancheria of Nueva Vizcaya. The former were contemplating such a step for the purpose of taking heads in retaliation for some that had previously been taken by Allmit. This detachment succeeding in arriving before any damage had been done, and undertook to argue with the Mayayao people as to the necessity of giving up this custom. To all arguments their answer was the counting of three fingers, to indicate that that number of heads had been taken and it would require three heads from the other rancheria to bring about peace. However, they were induced to let the matter drop for the present and to keep peace so long as the other rancheria did.

It may be well to remark that these two rancherias had been at war with each other for a number of years before the American occupation, but on the arrival of the latter they were ordered to make peace. This was done and the usual pledges given by the exchange of presents. This peace agreement was kept until about four years ago, when it was broken by the Mayayao people, the reason being given that the agreement was no longer binding, as the grass on the ground where the peace meeting had been held was dead. Since then the war between these people has been kept up, and probably 20 heads have been taken by each side. To discourage this head-hunting practice, and establish a more peaceful and secure footing, a detachment of constabulary, under the command of Lieutenant Schuele, has been established at Mayayao. However, as there is practically a rice famine, the subsistence of the command and the transportation of supplies becomes a serious problem.

Since the detachment has been stationed at Mayayao they have succeeded in preventing several fights. About a month ago 30 Igorots, accompanied by 1 corporal and 2 soldiers, left for the Machanan. While cutting timbers for the new constabulary cuartel now being built, a band of Ynulubans appeared on the hill above them, and others of the same band on the hill opposite. The Mayayaos called and asked if they were friends. The Ynulubans replied that they did not want to be friends with the Mayayaos and threw their spears at them. The soldiers then fired 4 rounds at the Ynulubans, who ran off. No one was hurt.

In the maintenance of the law throughout the Christian part of the province, the greatest obstacle is the pettifogging "pica pleitos," with whom the province seems to abound, and their satellites, with a sprinkling of such disgruntled spirits as have been the recipients of justice. As an instance of the affrontery

of these gentry, I may cite a case at Cauayan, where two prisoners were brought before the justice of the peace, tried and sentenced to twenty days by the court, and remanded to jail under the custody of the sergeant of the municipal police. A day or two after one of these pettifoggling disturbers presented himself at a council meeting and demanded to know by what right these men were detained, and by a perversion of facts he convinced the presidente and council that they had a case of illegal detention on their hands, with the result that he secured the release of the prisoners.

Economically the people are about as well off as they have been for the past two or three years, having recovered from the disastrous floods of September and November, 1906. Of course there are still a number of people who have not been able to rebuild their houses, which were swept away at that time, but they are being taken care of by their more fortunate friends and relatives.

There are no epidemic diseases prevalent, and the general healthfulness of the people is good.

The tobacco crop has turned out very good, and it is expected that the price will be much higher, owing to the scarcity of the same in Cagayan.

Religious and political.—With regard to the religious and political status, there have been no religious disturbances of any kind during the past year. In fact the temperament of the two peoples who constitute the bulk of the population is such that a possibility of any serious difference is reduced to the minimum. The native Cagayano is too apathetic and the Ilocano too busy with his material welfare. Politics seem to play but a small part in the affairs of the people. Five candidates are in the field for representatives of the Assembly, none of whom seem to have any following, and the campaign is being carried on in such a manner that one would never suspect anything of the kind was going on.

Scouts.—There are no scouts or any other military organization in this province.

Municipal police.—A marked improvement in the municipal police has been noticeable in the last three months in their general appearance and the manner in which they perform their duties. This is the result of sweeping changes that have been made in the personnel. In Ilagan the former captain of police was allowed to resign on account of general inefficiency, and 10 of the police were dismissed and charges preferred against them for complicity in thieving carried on by the provincial guard. In Cabagan Nuevo the lieutenant in charge of the police was requested to resign on account of irregularities in office. At Echague an American has been appointed lieutenant of police and he has brought the force of that town up to a very good state of efficiency. In the remaining towns the police forces are very small, consisting of four or five in each town and the efficiency is correspondingly lessened. It has been found necessary to dismiss various members in nearly all of the towns for inattention to their duties, and other derelictions, so that the force is now gradually assuming the semblance of an effective organization, and their work of late has been quite satisfactory. As far as practicable inspections of the police are made monthly and show a marked improvement both in their appearance and efficiency. The improvement of the police force and general condition of the province is largely due to the activity of Captain Olson, who is a recent appointee as senior inspector.

LA UNION. •

The province of La Union, generally speaking, has been quiet and free from organized bands of ladrones during the period covered by this report. Like other provinces along the coast it has had its share of petty robberies, but in the majority of cases, these have been committed by the people living in the provinces of Pangasinan and Tarlac. La Union, owing to its location, is the thoroughfare between Pangasinan and Ilocos Sur, and people making trips north and south are obliged to pass through it, so that when opportunity presents itself to the criminal element they rob the people in the isolated barrios. The presidentes of all the pueblos along the main road have given orders to the effect that all strangers in the jurisdiction of their respective pueblos, must remain near the tribunals at night and not in the barrios as has been their custom in the past.

La Union, considering its large population, location, and number of transients from other provinces, has but few criminals. During the past twelve months there have been 17 cases of robbery reported, and 18 persons arrested for same.

Of the 18 arrested 7 were from Pangasinan, 4 from Tarlac, and 7 residents of La Union, which goes to show that the majority of the criminals operating here belong to other provinces. This province is practically free from carabao ladrones, there being only now and then an isolated case.

During the past year three bagulos visited this province, one on September 6, 1906, one on September 19, 1906, and one on September 27, 1906. The first two did little or no damage, but the last one destroyed crops and buildings to the value of about ₱60,000 in the pueblos located in the southern part of the province.

In the months of August and September, 1906, the diseases surra and rinderpest broke out among the animals in the southern half of the province and killed about 175 ponies and 150 carabao. At the present writing some animals are dying in the pueblos of Tubao and Santa Tomás, but there are no symptoms of the diseases mentioned above.

Religious and political.—The religious conditions in the province are quiet and peaceful throughout the entire district. At present there are three churches—Aglipayano, Roman Catholic, and Protestant. During the past eleven months there has been no trouble between the followers of these orders, as each confines itself to its particular work and interferes in no way with its neighbor's views, customs, religious rites, or belief.

The political situation is somewhat strained and unpleasant, owing to the fact that there are two strong factions in the field, both of which are trying to down the other with a view to gaining supremacy in the question of the coming election for governor. The Hon. Governor Luna heads one faction, and Señor Sixto Zanducta, of Santo Tomás, is the leader of the other. Señor Zanducta was defeated at the last election for governor by Governor Luna.

Scouts.—There are no scouts in this province, but at Camp Wallace, near San Fernando, there is one squadron of the Tenth Cavalry.

Municipal police.—The municipal police, until November 15, 1906, were under the control of their respective presidentes, but on the recommendation of Governor Luna they were then placed under the control of the senior inspector. The improvement in the police force, both in appearance and efficiency, is marked, and on the recommendation of the senior inspector, approved by the provincial board, the municipalities have increased the pay of the police force, with the result that an intelligent force is now doing duty and cooperating with the constabulary in a manner that is extremely gratifying. The interest that the provincial governor has shown in the constabulary and in our efforts to raise the standard of the municipal police is very encouraging, and the zeal with which he keeps after the municipalities toward a successful prosecution of criminals, by his constant visits to those places requiring his advice, speaks volumes for the present peaceful conditions prevailing.

LEPANTO-BONTOC

The peace condition between the many rancherías is exceptionally good. Igorots to the south and southeast from Banaue (Nueva Vizcaya), Barling, and Lias, come all the way through the province to Cervantes, or for that matter go clear through to Candon, to do their trading, and from the north they come as far as Bangad and Mabuntot for the same purpose—this without soldier protection. Ilocano merchants come in scores over the new Tagudin-Cervantes trail and have gone as far as Lubuagan, bringing in their wares for sale or trade. Of course from Bontoc to Lubuagan these merchants accompany the constabulary patrol, but even so, it is something they would not have done two years ago and not for love or money, even with a strong guard, four years ago. Many merchants go in from the Abra side through Balbalasan to Lubuagan without any protection whatever.

Expeditions have been made to Barling, Lias, Bangayao, and Mayayao, Isabela, also to Nanon and Tabuc. Patrols are made semimonthly from Bontoc and Lubuagan, meeting at the rancheria of Butbut and weekly from Bontoc to the top of Polls Mountain, meeting the patrols from Banaue, Nueva Vizcaya.

During the past year the province has made great progress in road and trail building. The Tagudin-Cervantes road, though not completed, is open to traffic, and will no doubt prove of inestimable value. It is doubtful if the work of road or trail building could have made any material progress without the aid of the constabulary. Not through any fault of the supervisor, but lack of help—the right kind of help—Igorots with some authority. The province is in a majority of cases furnished an American foreman who has been assisted

by a noncommissioned officer and six constabulary soldiers, and in many cases the constabulary alone have looked after repairs to trails and bridges. Consequently the trails are in fairly good condition.

The trails from Bontoc to Lubuagan, 52 miles, and from Lubuagan to Balabasan, 24 miles, have been repaired with the constabulary assistance. Also a new trail from Lubuagan to Mabuntot, a distance of 6 miles, and one now under construction from Lubuagan to Lubo, a distance of about 30 miles, half of which is completed.

Any temporary slides, washouts, etc., to the trails are always looked after and repaired by the constabulary. Camarines or resting houses have been constructed under constabulary supervision at Sadanga Danu, Tinglayan, and Bangad. These camarines are an absolute necessity, especially during the rainy season, when travelers or patrols are caught in a baguio between the rancherias and unable to cross the rivers.

Some six or seven miners are at work at Mancayan and Suyoc, mostly doing their assessment work. The old Balbas copper-mine workings at Mancayan have been cleaned out and retimbered where same was necessary. In doing this thousands of tons of valuable copper ore have been deposited on the dumps ready for smelter. A copper placer claim taken up below the large copper mines has been worked. The copper ore (float) has been piled up on the sides of the creek, so as to not be washed away by heavy floods. Several thousand feet of cross-cut tunneling have been driven, and more activity in the mining region can be seen to-day than ever before during American occupation. The gold properties at Suyoc are also being worked, especially so across the east fork of the Abra River at Dugong, where some valuable gold ore is being taken out and shipped to the States for smelting. The Igorots are always taking out more or less gold, both from the river and quartz.

A promoting company—the Lepanto Mining Company—has been incorporated, with such men as Mr. Wood, of Smith Bell & Co., Doctor McDill, Mr. Wolfe, of Castle Brothers, and others, at the head of it. This company has bonded some 40 to 50 claims, agreeing to pay for same at the rate of \$10,000 to \$75,000 per claim in the three years' time. The company has secured from the Commission a franchise to build an automobile road from the coast to Mancayan. It is intended to run into Bangar, La Union. It is expected that work on this new road and on smelting, etc., will be begun before the end of 1908.

Religious and political.—The question of religion or politics is not a disturbing element with the Igorot. There are, however, several Episcopal missionaries located at Sagada and at Bontoc, and there is a movement on foot to establish Catholic missionaries there.

A sawmill is being operated by the Episcopal missionary organization at Sagada, which will undoubtedly afford work to many of the Filipinos located in this locality, as well as enable other interested parties to avail themselves of the lumber that is not required for the erection of Episcopal buildings.

Scouts.—There are no scouts or other military organization in this province.

Municipal police.—The only semblance of police are located at Cervantes and Tagudin, the latter in the Amburayan district, recently belonging to Ilocos Sur. The police force of the latter town is fairly efficient, but is capable of doing better work. In the various rancherias they have policemen, or rather they are called "pollistas," whose duty is practically confined to serving as messengers to the municipal authorities, or carrying letters from one rancheria to another, and securing forage for animals of officials passing through the province, or cargadores for the transportation of cargo.

MEDICAL ORGANIZATION.

The report of the district surgeon is herewith given in full:

BUREAU OF CONSTABULARY, MEDICAL DIVISION,
Vigan, Ilocos Sur, June 30, 1907.

THE ADJUTANT FOURTH CONSTABULARY DISTRICT,
Vigan, P. I.

SIR: In compliance with the verbal instructions of the district director, I have the honor to render the following report of the operations of the medical division of this district during the fiscal year ended June 30, 1907:

PERSONNEL.

The personnel of the medical division consists of 2 medical officers, 1 sergeant, 1 corporal, and 9 privates, distributed as follows: One medical officer, 1 sergeant, and 2 privates at Vigan; 1 medical officer and 3 privates at Tuguegarao; 1 corporal and 1 private in Isabela; 1 private each in Lepanto-Bontoc, Cagayan, and La Union.

The personnel, both commissioned and enlisted, while sufficient heretofore, is sadly inadequate because of the addition of two subprovinces to the district and the increase in constabulary stations.

HOSPITALS.

There are two hospitals in the district—one at Vigan and one at Tuguegarao.

The Vigan Hospital occupies a small but well-adapted building, and the equipment, while not all that may be desired, is fair. A room is set aside for the treatment of insular and provincial employees.

The Tuguegarao Hospital is located in an old nipa building, which is neither sanitary nor comfortable. Unsuccessful attempts have been made to secure a better building for this hospital.

There were admitted to the Vigan Hospital 44 cases, as follows: Febrile diseases, 12; gastro-intestinal, 3; surgical, 12; venereal, 4; other ailments, 12; number of deaths, 0.

The Tuguegarao Hospital treated during the period from July 1, 1906, to May 31, 1907, 80 cases, as follows: Febrile diseases, 47; gastro-intestinal, 11; surgical, 4; venereal, 6; other ailments, 12; number of deaths, 0.

As may be seen from the above, the health of the command, on the whole, has been exceptionally good, though of course the figures do not show the large number of men treated who were not excused from duty.

The entire command was vaccinated during the past year, and all stations in the district, excepting Cervantes and Bontoc, were inspected by a medical officer.

RECOMMENDATIONS.

Owing to the large number of isolated constabulary stations in the district it is respectfully recommended that a medical officer be assigned in charge of the Vigan Hospital, so that the district surgeon may be foot loose and be able to proceed, without delay, to any station when necessary.

The recommendation of my predecessor—Captain Wheate—in the last annual report in connection with the training of men from each company in first aid, etc., is heartily concurred in.

Very respectfully,

C. H. SOLL, *District Surgeon.*

CONCLUSION.

Cattle stealing.—There seems to be a belief throughout the district that where cattle stealing is done by individuals, and is not triable under act No. 1121, the punishment meted out does not fit the crime. Particularly is this so when a criminal charged with the crime of "hurto," on pleading guilty, as a rule receives the minimum punishment.

While cattle thieving is not so great a menace to society as the crime coming under the bandolerismo act, the injury to the small farmer is just as great. A great deal of dissatisfaction is caused from the fact that persons convicted of this crime, after serving their sentence, proceed to do the same thing over again. The abuse in this respect was so great in the province of Ilocos Norte that the matter was discussed seriously by the assembly of presidentes with a view to securing a remedy for the evil. Furthermore, another difficulty that seems not to have been adequately provided for is the tendency of many persons when arrested for cattle stealing to present the testimony that the animals found in their possession had not been turned over to the municipal authorities through ignorance or for some other reason. It would seem that act No. 1147 does not cover the cattle-registration question sufficiently to provide a punishment that will eliminate this abuse and impress the finder with the necessity of delivering strayed animals to the proper authorities with a reasonable degree of diligence.

Necessity for increased strength.—In view of the extent of territory to be covered and the necessity of American officers in charge of stations in non-Christian districts, I would respectfully recommend increasing the number of

companies in this district to 14 instead of 11, making the authorized enlisted strength for the district 612 instead of 562, as at present—an increase of 50 and a corresponding increase of 6 officers.

If it is the desire to carry on our work among the non-Christians to a successful issue, it is suicidal to have a detachment of soldiers not commanded by an American officer at any station in Lepanto-Bontoc, or in the non-Christian districts of Cagayan, Isabela, or Ilocos Norte. The work of handling the many disputes and disposing of the many complaints which constantly present themselves to the officer commanding a constabulary detachment among the non-Christians is such that the ordinary soldier would be a dangerous man to regulate them, separated as he is so far from his immediate commander.

In the province the following towns or rancherías have constabulary stations: Cervantes, Bontoc, Lubuagan, Balbalasan, and Tagudin. Stations will very soon be established at Mangall and Tabuc, both in the new subprovince of Kallanga. None of these stations are capable of being reached from within one and a half to two days from the next nearest station, and from Bontoc, where the office of the senior inspector is located, to the stations of Mangall, Balbalasan, Tabuc, and Tagudin it is a distance of from three and a half to five days when the rivers are fordable, which is very uncertain during the rainy season.

It is therefore recommended that the following be authorized as the number of companies and the maximum enlisted strength of the different provinces of this district, this strength being considered the very lowest at which anything like satisfactory work can be done:

Cagayan:		
First company	45	Present authorized strength, 2 companies of 50 men each.
Second company	40	
Third company	40	
Total	125	
Ilocos Norte:		
First company	40	Present authorized strength, 1 company of 50 men.
Second company	40	
Total	80	
Ilocos Sur:		
First company	40	Present authorized strength, 3 companies of 50 men each.
Second company	40	
Third company	40	
Total	120	
Isabela:		
First company	45	Present authorized strength, 2 companies of 50 men each.
Second company	45	
Total	90	
La Union:		
First company	50	Same.
Lepanto-Bontoc:		
First company	45	Present authorized strength, 2 companies of 50 men each.
Second company	45	
Third company	45	
Total	135	
Summary:		
Fourteen companies	600	
Noncommissioned staff	12	
Grand total	612	

The above remarks I trust will not be construed as being pessimistic, or that the district is going backward. We can continue to do our work with the present strength, but I believe that with the opening up of the new non-Christian districts, our chances of doing so much and of taking such a large part in this work of development would be so great that I have stated conditions frankly, and recommended the above increase in strength that the successful accomplishment of results may be assured.

Very respectfully,

THOMAS J. MAIR,
District Director.

The EXECUTIVE INSPECTOR, BUREAU OF CONSTABULARY,
Manila, P. I.

REPORT OF DISTRICT DIRECTOR, FIFTH DISTRICT.

FIFTH CONSTABULARY DISTRICT,
OFFICE OF DISTRICT INSPECTOR,
Zamboanga, P. I., June 30, 1907.

SIR: I have the honor to submit the following report of events, operations, general conditions, and progress in the fifth constabulary district during the fiscal year ended June 30, 1907:

The district comprises the provinces of Surigao and Misamis, and the Moro Province, which is subdivided into the following civil administrative districts: Cotabato, Davao, Lanao, Sulu Archipelago, and Zamboanga.

Col. W. S. Scott was district director until December, 1906, when he was relieved by Capt. Herman Hall, U. S. Army, inspector for constabulary. The latter was in turn relieved by the undersigned on June 1, last.

The following officers constitute the present field and staff at these headquarters: Maj. Peter Borseth, district director; First Lieut. R. A. Duckworth-Ford, district adjutant; Second Lieut. H. F. Alexander, district supply officer; Second Lieut. E. L. Dunsworth, assistant district supply officer.

The policy of the government of the Moro Province has been to utilize the constabulary to the utmost, and many civil positions of trust and importance have been filled by our officers, in addition to their other duties, with credit to themselves and satisfaction to the administration. Maj. E. W. Griffith, senior inspector, constabulary of Lanao, held the governorship of his district with considerable success, and should be assigned to the fifth district on his return from leave of absence. It is the present intention of the legislative council to reappoint him governor of Lanao, which is probably the most difficult district to handle in the entire province. Capt. Henry Gilsheuser is district secretary and municipal president of Cotabato, and several other officers hold the subordinate, but nevertheless important, positions of deputy governor, tribal ward justice, auxiliary justice of the peace, etc.

As heretofore, the work of the constabulary in this district is somewhat different from that in other parts of the archipelago, particularly in respect to the handling of the Moros and other pagan tribes, and the authorities have aimed to instill the first principles of just, sound, and economical government into the various tribes by gaining the good will and confidence of their headmen, by inducing the people to trade through the Moro exchanges, and by the influence of the tribal ward courts, rather than by more drastic and forcible measures.

PEACE CONDITIONS.

Peace conditions are generally good throughout the fifth district, with the single exception of Lanao, and they have steadily and materially improved in even that turbulent region during the past twelve months, due largely to the patience, tact, and perseverance of Governors Griffith and Palmer, and to the dogged and incessant work of the constabulary of that district, who have been almost continually in the field.

The governor and department commander (General Bliss) is gradually transferring the onus of maintaining peace more and more upon the shoulders of the constabulary; and even when active hostilities are afoot in Lanao, the military almost invariably act in support of the constabulary (if they take the field at all), and the latter have consistently borne the brunt of any opposition shown by the outlaws. For this reason the general-service company has recently been increased to 70 men—thereby reducing the strength of other companies in the district.

The Moro exchanges, or trading stations, of which a great number have been established, continue to flourish, and in some cases have shown handsome profits. They have tended to greatly increase the trade in such jungle products as almaciga, gutta-percha, rubber, and hemp to the vast material benefit of the interior tribes who have gained a remarkable confidence in the power of the American Government to protect them from the depredations of the more warlike Moros.

Sporadic slavery still obtains in some of the more remote and least explored regions, but is rapidly being suppressed; human sacrifice has practically become a thing of the past, and considerable check has been placed on the former despotic character of the sultans, dattos, hadjis, and other headmen.

In view of the friction that has lately appeared in San Francisco over the Japanese on the school question and other issues, it may be noted that there

are a considerable number of able-bodied Japanese (probably 200 or more), resident in Zamboanga, who seem to carry on a thriving business as skilled laborers. Most of the building and carpentering work in Zamboanga is done by these people, and owing to their simple and economical mode of existence, as well as their energy, enterprise, and perseverance, they have succeeded in ousting both Americans and Filipinos from competition in their own special lines.

COTABATO.

Governor: Maj. C. C. Smith, Philippine Scouts.

Secretary: Capt. Henry Gilsheuser, Philippines Constabulary.

Senior inspector: Capt. Henry Gilsheuser, Philippines Constabulary.

The peace and tranquillity of this district are better at this date than they have been since American occupation. No organized band of outlaws is known to exist nor are any criminals at large. Two minor engagements with outlaws under Sultan sa-Dimabara occurred during the year, resulting in a loss of eight men to the outlaws, and none to the constabulary. Dimabara and his band have all since been either killed or captured.

Considerable field work has been done by the constabulary of Cotabato during the past year, with excellent results—particularly in the Buldoon region, which in part has been notoriously unsettled. While no actual demonstrations were made against the government, it was known that a bad element existed in that part of the country, and hitherto found it a secure retreat. No cedulas had ever been taken out, and the dattos were inclined to be dilatory in responding to requests of the authorities. Since Lieutenant Furlong's and Captain Johnson's expeditions (February 25 to May 3, 1907), however, conditions in Buldoon have vastly changed for the better. Every known criminal or outlaw has been accounted for, trails have been opened up, the country has been mapped, towns and barrios have been visited, and the headmen have been made to realize that further lawlessness will not be tolerated, and that they must mend their ways or forfeit their liberty.

The district of Cotabato covers an enormous territory, over which a single company of constabulary can not hope to exercise a very appreciable influence. This applies particularly to the Maridago and Cabacan country, and the regions south of Lake Buluan, where the inhabitants are hardly aware of the existence of the American people.

Political and religious conditions are quiet.

DAVAO.

Governor, First Lieut. Allen Walker, Philippine Scouts; secretary, Mr. Orville Wood; senior inspector, First Lieut. W. J. Platka, acting.

This is one of the two great hemp-producing districts of Mindanao, and there are at present well over 40 American plantations scattered along the Gulf of Davao, from Tagun in the north to Banos in the south, beside those representing European and Filipino interests. The copra industry, while still in its infancy, is steadily increasing, and most of the hemp planters have adopted the plan of interplanting their hemp with cocoanut trees. There are considerable stretches of hard-wood timber—such as ebony, molave, and ipil—which have been hitherto unexploited, and will require a large amount of capital, enterprise, and energy in its development.

The labor question is very important and will require careful study and handling in the future. The wild hill men are gradually being induced to come down to the coast settlements and plantations, and have proved the best laborers the planters have been able to obtain. The planters have organized themselves into a society called The Davao Planters' Association, for the "consideration and regulation of questions affecting the interests of the planters."

There are two small bands of marauders at large on the east coast. In the vicinity of Mati is a small band of Mandayas, led by Gadis, who occasionally descend from their mountain retreats to commit depredations on the coast; while near Cateel there is a band of outlaws, led by Louis Badudao and his son, which has perpetrated two atrocious massacres since March of last year. So far these outlaws have baffled all efforts of the constabulary to bring them to justice, and our difficulties are increased by the fact that the very people preyed upon will lend us no assistance or give us no information that might lead to their capture.

There are a number of Jesuit missionaries in Davao district who apparently sometimes show greater zeal than discretion in the pursuit of their calling. The senior inspector writes:

"Their opposition to the public schools from the pulpit, in public, and in private does the district an injury, and in some towns they have succeeded in closing the schools entirely. * * * They threaten to excommunicate the family of any native who permits his children to attend the public schools; and they furthermore characterize the Americans as anarchists and heretics. * * * Hell fire and eternal damnation is gratuitously promised those who have tracts or other Protestant literature in their possession."

The work of the constabulary is of course guided by the policy of the district governor. The majority of the inhabitants are wild pagans, of a low order of intelligence. They appear to realize intuitively, however, that the Americans wish to give them "a square deal" and are as quick to appreciate justice as they are to resent injustice.

The American colonists are earnest, progressive, and very enterprising, and the district will ultimately develop into a prosperous, wealthy, and important one.

LANAO.

Governor, Capt. J. McA. Palmer, U. S. Army; secretary, Mr. Allan Gard; senior inspector, Capt. William Green, acting.

This district stretches through the heart of Mindanao, from Iligan Bay in the north to Illana Bay in the south, embracing vast stretches of magnificent agricultural and grazing lands as well as immense forests of hard wood. Coffee, gutta-percha, and rubber grow wild in the interior, and an excellent quality of hemp is grown along the north coast. Cacao and copra are also produced.

It contains, however, the most turbulent Moro element in the island of Mindanao, and in spite of frequent punishment meted out by the constabulary to many recalcitrant dattos and their followings there are still a number of outlaws at large on the east side of Lake Lanao.

Ampunagous, of Malungan, district of Taraca, is the leader of a band of outlaws which infests the region between Romain and Maciu. These people are not given to pillage or other very serious crimes, but they continue to defy the American Government, and prey upon the more peaceful inhabitants for subsistence. This particular band numbers from 30 to 50 men, and they have about 12 Krag rifles.

On June 4 last Lieut. Leonard Furlong inflicted a severe punishment on a number of the followers of Nural Hakim in the Taraca Valley. In this engagement the constabulary loss was 2 killed and 3 wounded, while the Moros lost 17 killed. The cotta was taken by assault, the fighting being of a fierce, hand-to-hand nature, and the result reflects great credit on Lieutenant Furlong and his command.

On June 19 Lieutenant Furlong again encountered a body of outlaws under the notorious Ampunagous at Didaugun, and again routed them with a loss of 14 killed. The constabulary loss was 1 corporal severely wounded.

In these two engagements the following arms were captured: One Winchester carbine, 2 Remington rifles, 7 Tower muskets, 1 revolver, and a number of blade weapons. With the exception of this Taraca region the peace conditions may be regarded as satisfactory and are steadily improving under the rigid and energetic policy of Governor Palmer, which allows the outlaw element no rest, and there is little reason to doubt that the finish of this renegade opposition to progress, law, and order is within sight. However, the operations of Lieutenant Furlong have developed indications of a hostility, which may ultimately necessitate a call upon the military forces, to achieve this end.

MISAMIS.

Governor, Señor Apollnar Velez; senior inspector, Capt. G. D. Long.

This province has not suffered from any disturbances other than religious and political throughout the year. The only outlaw known to be at large is the old offender Baludong, who has successfully evaded the constabulary for several years. It is probable that the Montescos living far back in the mountainous interior still possess a few Remington rifles, which will eventually come in, as three such rifles have been taken up this year (1907). Crime is comparatively rare, and even carabao stealing is practically unknown, except among the Montescos and the people of Camiguin Island.

Political and religious questions, however, while they have occasioned no serious disturbances, constitute a sore spot in the province. The expediency of bringing Misamis within the jurisdiction of the government of the Moro Province has been mooted from time to time and has furnished a favorite theme for political orators, who abound in all of the more important towns. Antipathy for the established government obtains and is thinly or not at all veiled.

The province is torn with religious differences, but no serious clashes have occurred. On the whole the Aglipayanos predominate, though the Catholics claim they are slowly but surely recovering their former influence and following.

The first company of this province has had but few encounters with outlaws of minor significance, and there has been no real opposition to the authorities on the part of organized bands.

A large majority of the Filipino residents are ignorant and docile, completely led and influenced by their leaders, of which there are a few in each municipality or barrio.

Mambajao, on the island of Camiguin, is a very progressive municipality of the first class, well governed by municipal officials selected for their public interest. The island is rich in coconuts and hemp, and almost all the available land is under cultivation.

It appears that one Ramon Coronel, agitator and confidence man, was deported by Judge Wislizenus, of the court of first instance at Bacolod, Negros. To deport a criminal from the haunts where he is known, where the people by that very knowledge can be on their guard, and allow him to take residence in another district where he is unknown, can only do added harm.

SULU.

Governor, Col. E. Z. Steever; senior inspector, Capt. F. S. De Witt.

Peace conditions in this district are very satisfactory. Generally speaking, the people, who are busily occupied with their own affairs, such as farming, fishing, pearl fishing, boat building, etc., seem to be content with the American system of government as applied to themselves. The extent of land under cultivation has been considerably increased during the past year. Among the principal products may be mentioned hemp, coconuts, rice, tapioca, oranges, lemons, camotes, peanuts, pineapples, and the ubiquitous banana. Most of the taxes, except the cedula, have been promptly paid, and it is anticipated that the revenues will show an increase over that of last year. The cedula tax has not been collected, because no systematic effort has ever been made to force payment, and the Moros have not yet accustomed themselves to make voluntary payments.

There are no organized bands of ladrones in the district, there have been no serious encounters with outlaws during the past year, and crime has been reduced to a minimum. Only 6 murders are on record as having occurred, and in every case the murderers were promptly apprehended and turned over to the proper authorities for trial.

Having no political parties, religious and political conditions may be regarded as excellent. Much of the time of the senior inspector (as governor's representative) is spent in settling disputes, factional fights, etc., and performing the duties of municipal president and justice of the peace at Siasi.

SURIGAO.

Governor, Señor Rafael Elliott; senior inspector, Capt. Ole Waloe.

This province has been in an absolute state of tranquillity during the entire year. No organized band of outlaws exists nor are any bad criminals known to be at large. Only three murders have been committed so far as known during the past twelve months, and all of the perpetrators were arrested by the constabulary and are now serving sentence in Bilibid.

Politics and religious questions are quiet and normal. There are no irresponsible agitators on the stump, and the people have therefore not yet been disturbed by illusory visions of Utopian prosperity and magnificence, to be brought about by "immediate independence." In fact, the question of who owns the finest hemp plantation or the greatest number of coconut trees creates more interest and discussion than do all of the politics of the province and the archipelago combined.

From a religious standpoint, the Roman Catholic Church dominates the province. The Aglipayanos are represented by only 3 young priests, stationed at Cabadbaran, Dapa, and Loreto. In nearly all other towns the independent churches erected about three years ago have been allowed to fall into ruin, and the movement generally seems to have died out.

No uprisings have occurred during the year. The nearest thing to an engagement occurred in the month of August last year, when Subinspector Zapanta and 5 men were shot at with bows and arrows while in pursuit of a murderer in the mountains between San Juan and Veruela. One of the outlaws was killed, 1 was wounded, and 5 were captured, including the murderer.

ZAMBOANGA.

Governor, Capt. John R. Finley, U. S. Army; secretary, Mr. J. M. Browne; senior inspector, First Lieut. R. A. Duckworth-Ford, acting.

This district includes the peninsula of Zamboanga, the former district of Dapitan, the Island of Basilan, and over 100 small islands in the vicinity of the mainland of Basilan.

Not only the district government, but the government of the Moro Province, and headquarters, Department of Mindanao, are located in Zamboanga, the capital, which is situated at the extreme south of the peninsula. It is a clean, well managed, most picturesque little city, with a most promising future before it.

The following is a list of the more important government officials whose offices are located in Zamboanga: Brig. Gen. Tasker H. Bliss, department commander and provincial governor; John E. Springer, judge of court of first instance; R. M. Campbell, prosecuting attorney; Fred A. Thompson, provincial treasurer; Charles R. Cameron, superintendent of schools; George H. Bennett, collector of customs; Capt. J. P. Jervey, provincial secretary and provincial engineer.

There are two companies of constabulary—the first being now on detached service at Davao, its place being taken at Calarian prison by the second company, constabulary of Davao, under Capt. Waldo B. Williams, who is also warden of the prison.

Peace conditions in this district are excellent and the people have never been more tranquil or contented. Under the policy that obtains much of the police work of the district is performed by the headmen of the various tribes, who are vested with police powers within their tribes, and act under the immediate direction of the district governor. It has been his aim to patiently accustom the people to this system of government, who with the gradual spread of prosperity and enlightenment among them are gradually but surely reposing greater confidence in the friendly intentions of the Americans, and in their power to give them protection, and administer justice. The only parts of the district which can be said to be without the pale of civilization and the reach of law are the interior of Basilan, and the region occupied by the Kalibuganes and Subanos, in the northern interior.

The Moro Fair, held in Zamboanga, February 12 to 15 inclusive, proved a great success, and attracted a considerable number of people from other provinces and Manila, as well as from the outlying parts of Mindanao. Representatives from all of the pagan tribes were brought in, and there is no doubt but that their eyes were opened as they never were before to the vast power and unlimited resources of the American people. The exhibits included articles manufactured in the province, farm products, live stock, etc., together with a practical demonstration of the latest agricultural machinery, hemp stripping machines, and so forth.

First Lieut. R. A. Duckworth-Ford took over the duties of district adjutant at the beginning of November last year, vice Maj. John R. White, detached with the bureau of prisons. Lieutenant Ford has, by virtue of his office, taken charge of all the routine work of these headquarters, during the various absences of the district director, while on tours of inspection, etc. He has also been acting senior inspector of the constabulary of Zamboanga since December, 1906, as it was found expedient to consolidate the duties of senior inspector of Zamboanga with that of the district adjutant. This has resulted in a most desirable curtailment of correspondence, an improvement and concentration in the system of records, and an economy of administration, and has done away with a considerable amount of red tape and circumlocution.

GENERAL SERVICE COMPANY.

The general service company, with a strength of 70 men, is under the command of Capt. Frederick Johnson, and constitutes the reserve of the fifth district constabulary. At the beginning of the fiscal year 1907 it was stationed in Bongao, where the company had temporarily relieved the first Sulu, ordered to Zamboanga for recruiting and other purposes. During this period the Tawi-Tawi Island Group was thoroughly patrolled by the constabulary, traveling afoot or in small vintas, and covering over 600 miles in two months. A successful expedition was made to Tandubaas for the capture of an outlaw. The company returned to Zamboanga, August 8, 1906. While stationed here it has performed the usual garrison duties. Detachments of the company have rendered effective field service during the past six months against the outlaws of Basilan, district of Zamboanga, and in Lanao, Cotabato, the northern interior of Zamboanga, and in Misamis. A total of nearly 3,000 miles has been covered by the company or its detachments during the year.

SUMMARY OF SPECIAL EVENTS, UPRISINGS, ENGAGEMENTS, ETC.

July 1, 1906.—General Allen arrived in Zamboanga, and made a tour of the southern part of the district.

July 8.—Fifteen people brutally massacred at Alujud, a barrio of Cateel, district of Davao, by a band of outlaws under Badudao. These outlaws are still at large.

July 9.—Lieut. Leonard Furlong accompanied Major Boyd on an expedition to the Buldoon region, Cotabato, and had a successful engagement with outlaw Moros under Sultan sa-Dimabara, near the town of Bugasan—6 outlaws killed.

August 1.—Agricultural fair held at Cotabato.

August 3.—Lieut. James L. Wood took a field party to Pitturungan, Lanao, to arrest Moros Dumamba and Sincara, who wounded an American sentinel at Marahul, June 27, 1906. These 2 men with 3 others captured.

August 8.—Lieut. Jas. L. Wood arrested Pitilan, sultan of Lumbayao, for harboring criminals.

August 9.—Lieut. J. L. Wood led a field party in an attempt to secure Umama, a Moro outlaw who assaulted an American sentinel at Marahul, June 27, 1906. The man's house was surrounded, but most of the occupants effected their escape. One man, Umama's uncle, was killed.

August 14.—Lieutenant Wood, with 14 constabulary, arrested Alungu, charged with illegal possession of a Krag rifle. This rifle was recovered August 18 and turned over to the military authorities, by whom it had been lost in an early campaign.

August 17.—Expedition by Lieut. J. L. Wood, with 11 men, to Paulas, Lanao. Datto Paulus arrested, and 1 Remington rifle and 1 revolver, caliber .38, captured in his house.

August 28-29.—Lieut. J. L. Wood conducted an expedition to Uato, Lanao, and reports that most of the Moro brass ware, krises, kamplians, etc., used in Lanao are made in Tugaya. Lieutenant Wood describes process of manufacture in detail. Says much gunpowder is also made, but it is of very inferior quality. One muzzle-loading gun was captured.

August 29.—Anti-Catholic play presented at Ballango, Misamis. Later Capt. Herman Hall was ordered to investigate the trouble, by the Governor-General, with the result that a temporary substation was established at Oroquieta, Misamis, during the months of November and December.

August 31.—Lieutenants Wood and Bell made an expedition to Basag (Dulangan), Lanao, with 60 constabulary. Macadar Datto Grande, Alangan, and his 2 sons were arrested and 1 Krag rifle captured.

September 2 and 3.—Lieutenants Wood and Bell, with 58 constabulary, made an expedition to Bundi. Moro Bagambang was arrested and 2 Krag rifles and 215 rounds of ammunition taken. At Calasangan 1 Remington rifle and 45 rounds of ammunition were captured from the sultan of that place. Since this expedition conditions have materially improved, and things may now be considered normal in this vicinity.

September 5-7.—Capt. Henry Gillsheuser made an expedition from Parang-Parang to Bugasan to obtain information of and locate Sultan sa-Dimabara and other renegade Moros, to find a suitable Moro for appointment as headman, and

to look into the commercial, industrial, and productive possibilities of the country, the establishment of markets, and the conditions of the people in general. This expedition was generally successful.

September 16.—Capt. Herman Hall arrived in Zamboanga and assigned as assistant district director.

October 15.—Agricultural fair held at Jolo. Lieutenant Duckworth-Ford arrived in district and assigned as adjutant.

November 8.—Col. W. S. Scott relieved as district director. Captain Hall assigned as acting district director. Maj. E. W. Griffith relieved as senior inspector and governor, district of Lanao, to enable him to go on leave of absence. Capt. John McA. Palmer, U. S. Army, appointed governor, and Capt. William Green appointed acting senior inspector, Lanao.

December 10.—Capt. F. Johnson relieved as acting senior inspector, constabulary of Zamboanga, and ordered to Misamis on detached service. Lieut. R. A. Duckworth-Ford assigned as acting senior inspector, Zamboanga.

December 13.—Lieut. J. O. Bell while leading a reconnoitering party in the Maciu region of Lanao, attacked by a party of hostile Moros. Lieutenant Bell received a gunshot wound in hand; one private also wounded.

January, 1907.—Magumpara, a Maciu Moro of some influence, was induced to come in, and presented a Krag rifle and a Krag carbine.

January 7-18.—Lieutenant Furlong, with 16 men, accompanied Captain Foster and detachment of Nineteenth Infantry through Barrera, Buldoon, and Butig regions of Cotabato, with the object of arresting the murderers of Patrick Burns, and to arrest Sultan sa-Dimabara and other renegades for their part in the murder of Private Macdonald. On January 16 Lieutenant Furlong captured a man calling himself Cabugatan, suspected to be Dimabara. This man, together with another prisoner, was sent to Malabang under guard, January 20, 1907, and both turned over to Captain Foster.

January 29.—Lieutenant Wood surprised a camp of hostile Maciu Moros and captured 4 muskets and a few prisoners.

January 31.—Capt. Waldo B. Williams relieved as senior inspector, constabulary of Davao.

February 1.—Lieutenant Ford and 15 men, general service company, accompanied Governor Finley to Curuan, Zamboanga, the inhabitants of which locality had been terrorized by a small band of Joloano Moros, who had landed in the vicinity. The latter escaped in their boats before the arrival of the constabulary.

February 14.—Capt. Wm. Green, with Lieutenant Merrill and 35 constabulary, surprised a hostile camp at Apa, killing 6 Moros, and capturing a number of krises and campilans.

February 27.—Lieut. J. N. Merrill, with 19 constabulary, accompanied by a military mapping party, made an expedition through the Puno-Maciu country. Captured 1 Tower musket, and later captured another, together with 1,000 rounds of Krag ammunition.

March.—During this month 5 Krag rifles were presented by Moros of the Maciu district, owing undoubtedly to the aggressive attitude of the constabulary and the district governor.

March 2.—Lieut. J. N. Merrill led an attack on the cottas occupied by Sultan Dilumbayan, and the double cotta held by Sultan Uali Ulama, of Maguing, Puno Maciu. Both attacks were successful. Nineteen Moros, including both of the leaders, were killed. In the second assault Lieutenant Merrill was severely wounded in the knee, with a kris in the hands of Sultan Uali Ulama, whom he shot and killed. For his gallantry on this occasion Lieutenant Merrill was specially mentioned in General Orders. One Tower musket and a number of blade weapons captured.

March 4.—Capt. Herman Hall relieved as acting district director, and appointed district director.

April 28.—Expedition by Capt. Wm. Green and Lieut. J. L. Wood against Lanao Moros, near Marahul. Lieutenant Wood received gunshot wound in left thigh; not serious. Private Gulimba received two gunshot wounds in leg, both serious. The latter died May 5, and was buried at Keithley with full military honors. One other private slightly wounded in this engagement.

May 31.—Capt. Herman Hall relieved as fifth district director.

June 1.—Maj. Peter Borseth, district director, assumes command of the district.

June 4.—Lieut. Leonard Furlong, with Lieutenant Tarbell and a mixed command of about 60 men attacked cotta occupied by the followers of Nural Hakim

and Ampunagous (Lanao), with success. Nineteen outlaws killed and 7 guns captured; 2 constabulary killed and 3 wounded.

June 19.—Lieutenant Furlong, with Lieutenant Wood and 53 constabulary, encountered the renegade Ampunagous at Didaugun, with the result that 14 Moros were killed and the remainder routed. Corporal Gumayog of the constabulary was severely wounded. The following arms were captured from the outlaws—one Winchester carbine, 2 Tower muskets, 1 revolver, and a number of blade weapons.

MUNICIPAL POLICE.

Zamboanga.—The police of the city of Zamboanga have noticeably improved in efficiency during the past twelve months, but there still remains plenty of room for improvement. A competent and energetic American chief is essential, if they are to be brought to such a standard of efficiency as a capital and port so progressive and commercially important as Zamboanga has a right to expect. They are under the direct control of the municipal president and council and are not inspected by the constabulary.

Davao.—None of the municipalities of this district, of which there are five, make more than a pretense of maintaining a police force. The town of Davao has 3 policemen armed with Remington shotguns, who are employed mainly to guard prisoners doing night work; otherwise they are useless. Lieut. J. R. Youngblood has recently been appointed chief of police of Davao, and the force is shortly to be increased to a strength of 1 lieutenant and 6 men. In addition, however, there is a district police force of 25 men, who have proved themselves really valuable in running criminals to earth.

Catubato.—The municipal police of this district are generally efficient, are suitably armed and uniformed, and perform their duties well. They have been inspected at various times during the past year, and have never failed to make a creditable showing. Their principal duties consist in guarding prisoners and enforcing municipal ordinances, but at times they have been successful in making arrests for the more serious crimes committed outside of the limits of their municipalities.

Sulu.—The municipal police of Siasi consist of 3 patrolmen, armed with blade weapons. They are of no practical benefit, and would be useless in case of serious trouble in the town. They have been inspected frequently during the past year. The police of Jolo consist of 1 sergeant, 1 corporal, and 12 patrolmen. They are not inspected by the constabulary.

Surigao.—There are 12 municipalities in this province, the combined police force of which is made up of 9 sergeants, 10 corporals, and 37 patrolmen, who are all armed with bolos and clubs. They are poorly uniformed and paid, and are somewhat lacking in discipline, though they are willing and loyal. Some effort has been made by the senior inspector and others to bring the police to a higher and more efficient standard, but the leanness of most of the municipal exchequers has made this difficult of accomplishment. Generally speaking the police are drawn from a poor type of men, who are constantly being changed for new recruits of the same class. The policy of the senior inspector has been to endeavor to create a spirit of emulation and rivalry between the police corps of the various towns rather than to criticise them.

Misamis.—In this province there are 8 sergeants, 12 corporals, and 112 patrolmen, constituting the entire force of municipal police. Their efficiency varies considerable in the different towns. At Oroquieta, for instance, they are very good, while at Initao they are poor. Rated generally they may be classed as fair and improving. The police throughout the province are well uniformed and a number of them are armed with revolvers, Remington rifles, or Remington shotguns, while others are armed with clubs and blade weapons.

PERMANENT BUILDINGS.

The new district headquarters building, which has been under construction during the past year, has now been completed and is ready for occupation. The total cost of the same amounts to about ₱44,000, but so far no arrangements have been made for stables, wagon sheds, carpenter shop, stablemen's quarters, or for a sick ward or dispensary; nor has there been any allotment for fencing, filling in, and other necessary improvements on the reservation. The inspections and supervision of construction of the new building have been attended to by Capt. J. P. Jervey, engineer of the Moro Province, and his assistants.

There have been taken up the following buildings, which formerly belonged to the Spanish Government, but which are now occupied by the constabulary in this district:

	Description.	Approximate value.
Tucuran	One stone building	₱1,000
	do.	2,000
	do.	2,000
	One frame building	2,000
Siasi	One building, one story stone, with wood and iron roofing	8,000
	One building connected with above, stone, nipa roofing	2,000
Bongao	Three stone buildings with iron roofing	8,000
Cotabato	One building, frame, iron roofing	2,000
Davao	One building, nipa sides and roof, pine floor	1,500
	One building, wood	500
Mati	One building, nipa roof	2,500
	One building, nipa roof, board floor	1,500
	One building, wood and cogon, hard-wood floor	150

The cost of repairs on these buildings for the past year, including authorities now on file for expenditures of this nature, approximate ₱600. A considerable amount should be expended on these buildings during the fiscal year 1908 in order to put them in a proper state of repair.

It is also recommended that ₱500 be appropriated for the construction of a boathouse at Zamboanga. Boats from outlying stations are not infrequently sent here for repair. At the present time the district supply officer has 4 boats in Zamboanga without any proper shelter for them and in the event of heavy storms they are likely to break their moorings and suffer considerable damage.

The following additional buildings are required in connection with district headquarters and should be erected on the constabulary reservation at Magay, Zamboanga, with the least practicable delay: Wagon shed, stables for 10 horses, oil shed, and teamsters' quarters.

A detachment of about 15 men is all that is needed in Zamboanga for guard duty at district headquarters, general police, orderlies, etc. With this arrangement sufficient room will be available for all purposes.

TRANSPORTATION.

Transportation facilities have been only moderately good during the past year. A launch has been rented from the bureau of navigation, at ₱80 per day, which has been used almost exclusively by the district director in making his inspections of the district, and owing to the uncertainty of its movements little shipment of supplies has been made therein. Until the month of May this year, when it was sent to Manila for repairs and its place taken by the *Coron*, the launch *Rover* was employed at the same rate. The *Coron* is inferior to the *Rover* in seaworthiness, accommodation, and carrying capacity, and I recommend that it be recalled and that a more serviceable craft be furnished the district.

The steamship *Borneo*, which was subsidized by the government of the Moro Province, has been successfully operated between the ports of Dapitan, Misamis, Zamboanga; Zamboanga, Jolo, Siasi, and Bongao; and Zamboanga, Tucuran, Malabang, Cotabato, Mati, and Davao. The rates were exorbitant, and an additional charge of 20 per cent was collected on freight rates at ports without docking facilities. The *Borneo* has now been chartered by the military and taken off the run. To take its place *Butuan*, operated by the Compañia Marítima, has been subsidized by the provincial government, and the rates have been materially reduced.

The following scheme, suggested by Lieut. H. F. Alexander, district supply officer, is submitted for what it is worth:

That a regular coast-guard cutter be chartered by the constabulary and employed by the fifth district in the following manner: To make a trip to Manila once every two months for the purpose of obtaining funds and supplies, calling at Iloilo on the way north, and on its return voyage touching at Mindoro, Romblon, Masbate, Cebu, Tagbilaran (Bohol), Surigao, Cagayan, Iligan, and Dapitan.

The next route would be: Zamboanga to Jolo, Siasi, Bongao, and Sitankay. The third route would be from Zamboanga to Tukuran, Malabang, Parang, Cotabato, Mati, Davao, and return to Zamboanga.

This schedule could of course be more or less modified at any time to meet the requirements of the moment.

Lieutenant Alexander assumes that the saving on transportation of supplies from Manila to Zamboanga and outstations, as well as to Masbate, Cebu, and other points above mentioned, plus collections from passengers, would fully compensate for the difference between the amount now paid for the launch *Coron*, and for that of a large, fast, and seaworthy cutter.

The undersigned is not, however, sufficiently familiar with all the needs and conditions of the district—owing to his recent arrival—to make any recommendations or suggestions of his own upon it. I am inclined to think the idea should be given some consideration, as there can be no question that the system of transportation obtaining in this district at present is as inefficient as it is unsatisfactory.

Sailboats, sapits, etc., have been supplied to all stations where needed.

Bull carts, handcars, and wagons have also been furnished stations where in the discretion of the district director they are necessary.

The United States Quartermaster Department has been most liberal, and we have rarely been refused accommodation in the way of transportation of supplies when asked for.

ARMS AND EQUIPMENT.

There are at present 5 companies equipped with the new United States magazine carbines, remodeled, with bayonet. The first shipment of the new guns was received in the latter part of March last, and were promptly transhipped to the Cotabato and Lanao constabulary. The second, received in May, was furnished to the first company, constabulary of Misamis, stationed at Cagayan, the general service company at Zamboanga, and the second Davao company at Calarian prison. There is now on hand, awaiting shipment, a supply of new guns for the first Davao company at Mati. The ordnance officer, Manila, has informed the district ordnance officer that no more of the new carbines can be supplied before September next.

The remaining companies are still equipped with the Springfield carbines, the majority of which are considerably worn, and are constantly in need of spare parts. Otherwise all companies throughout the district are well equipped.

All requisitions for ordnance are made through the district adjutant and are, as far as possible, filed by the district ordnance officer, Lieutenant Dunsworth, the balance being requisitioned for from Manila.

Arms and equipment have been furnished certain municipal police in the district when properly authorized.

The only serviceable ordnance stores now on hand (not issued) are web belts, caliber .45; waist belts, revolver holsters, cartridge pouches, and revolvers—Colt, double-action, caliber .45. It is recommended that an ample supply of reserve ammunition, as well as spare parts for the new Krag-Jørgensen carbines, be furnished the district ordnance officer as promptly as possible.

There is some conflict of opinion among officers of this district as to whether or not enlisted men (and particularly the Moros) should be allowed to wear shoes when on field service. Captain Gillsheuser, of Cotabato, maintains that shoes are a needless impedimenta to a type of man who has gone without footwear from time immemorial, while Lieutenant Platka remarks: "The Filipino soldier should be issued shoes if for no other reason than the additional pride it leads him to take in himself and his appearance. We only cheapen our organization by compelling our men to go barefoot. To their minds we are forcing them back into the Tao class, stifling their ambition, and placing a restriction upon them which prevents their mingling with the better class of Filipinos."

The fez and puttees are considered far more serviceable than the cap and legging used by the constabulary of other districts. While the fez provides no shade for the eyes, it may be regarded as the national headgear of most Mohammedan peoples. It furnishes considerable protection against the rays of the sun, on account of its substantial material, is of healthful color, according to medical science, and is smart, soldierlike, and unique. The puttees have proved to be more durable than the canvas legging; they insure a maximum of neatness, as they fit any leg, and are to a large extent waterproof. Army offi-

cers have frequently commented on the smart, soldierly appearance of our Moro constabulary, and have remarked on the fezes and puttees as being peculiarly suitable to this type of soldier. Several of our officers have suggested that they be authorized to discard the present khaki cap in favor of the fez, claiming that the thin khaki covering of the cap affords absolutely no protection to the top of the head against the sun's rays, which are very intense in this part of the archipelago. It may be remarked, incidentally, that British officers detailed to the Egyptian army wear the fez in common with the men. Many officers in this department have adopted the spiral puttee in lieu of the leather legging.

MEDICAL ORGANIZATION.

In January of the present year the district hospital in Zamboanga was done away with, and Capt. Albert Butler, the district surgeon, was transferred to the third district. Since that time the constabulary of Zamboanga and Sulu have had to depend on the military for medical and surgical service, and enlisted men suffering from any serious complaints in these two districts are admitted to and treated in the military hospitals at Zamboanga or Jolo.

Under normal conditions this system seems to be fairly satisfactory; but should an epidemic of cholera, smallpox, or other serious disease break out among the men, the lack of a constabulary surgeon at district headquarters would undoubtedly occasion considerable inconvenience, particularly now that the new building is completed. The enlisted men's barracks are located on the ground floor of this building, on the opposite side of the hallway to the district supply officer's storerooms and office; and in the event of a serious epidemic there can be no doubt but that all officers or clerks residing or employed within the building would be quarantined by the sanitary officer within the building. This would seriously incommode the transaction of official business and would involve no slight inconvenience to officers and employees for an indefinite period. Moreover, the new building is about a mile farther from the hospital than are the present barracks, so that under existing arrangements the sick would be required to walk a total distance of nearly 4 miles each morning in order to receive proper attention.

I am of the opinion that a small ward and dispensary should be erected within the reservation, but as far removed as possible from headquarters building, and placed in charge of a qualified medical inspector or, if this is impracticable, of an experienced sergeant of the medical division.

In Cotabato sick men are treated by the military surgeons. No personal compensation is paid for these services, the only charges being the regular hospital fees and the cost of medicines prescribed and furnished.

Capt. E. W. Ames, surgeon, Philippine Constabulary, has a small ward in a good building in the town of Davao, and looks after that entire district. He visits the constabulary garrisons on the east coast once every month, the remainder of his time being put in at Davao, where there are many calls upon his time and services. This officer, I believe, does a considerable amount of gratuitous work among indigent Filipinos and the wild tribes of the district.

First Lieut. C. E. Laws, M. D., Philippine Constabulary, is stationed at Cagayan, Misamis, where he has a small dispensary. All of the stations on the northern coast of Mindanao are under his medical care and supervision.

PHILIPPINE SCOUTS.

There is no regular cooperation between the constabulary and scouts in this district. The seventh battalion of Philippine Scouts, consisting of the Eighth, Ninth, Tenth, Eleventh, Forty-second, and Forty-fifth companies, under the command of Maj. C. C. Smith (captain, Fourteenth Cavalry, and district governor), are on duty in the district of Cotabato. The stations are Cotabato (headquarters), Pikit, Kudurangan, Reina Regente, and Parang-Parang.

The Forty-fifth Company was stationed in the district of Davao from July, 1906, until May 3, 1907, when it was transferred to Parang.

Other scout companies within the district are as follows:

Fortieth Company, Camp Overton, Lanao, and the Fiftieth Company at Margosa-Tubig, district of Zamboanga.

RECOMMENDATIONS AND CONCLUSION.

Another general-service company of 50 men is very necessary in this district, owing to the unprecedented amount of difficult fieldwork which has been called for in Lanao district. The headquarters of this company should be at Isabela de Basilan, where splendid quarters are available in the old Spanish fort on top of the hill overlooking the river and harbor. The effect on the people of Basilan would assuredly be beneficial, as the presence of the company would lend confidence to the loyal and would check the smoldering disaffection of the more lawless element who, as a matter of fact, constitute a considerable proportion of the population of this unexploited and little known island. Nothing definitely is known apparently as to the number of guns out in this island, but it is rumored that there is a large number.

While mistakes and errors of judgment have been made occasionally, officers of this district have as a general rule labored conscientiously and efficiently in the interests of the government, the people, and the service, and results have been exceedingly satisfactory. Senior inspectors and company officers have alike displayed a laudable interest in the enlisted men under their respective commands, both in regard to their personal welfare, comfort, and recreation and in respect to their instruction and training—military, civil, and scholastic.

A marked friendly feeling continues to obtain between army officers and ourselves, and most of our officers stationed in Zamboanga or the vicinity are auxiliary members of the Army and Navy Club.

The general-service company stationed in Zamboanga has in the past been tied to that station, as its duties in a great part have consisted in furnishing guard for headquarters, guards for working parties of provincial prisoners, and police duty. This company will be relieved from all duty as soon as another detachment is available, and will be exclusively used for field duty, as intended when organized. When not in the field the general-service company will be stationed in Isabela de Basilan, where the constabulary has excellent barracks.

Attention is invited to my letter to the executive inspector dated June 28, 1907, recommending an increase of the constabulary of the fifth district by 4 companies.^a

Respectfully submitted.

PETER ROBSETH,
District Director.

To the EXECUTIVE INSPECTOR, BUREAU OF CONSTABULARY,
Manila, P. I.

REPORT OF SUPERINTENDENT, CONSTABULARY SCHOOL.

BUREAU OF CONSTABULARY, CONSTABULARY SCHOOL,
OFFICE OF THE SUPERINTENDENT,
Manila, P. I., July 22, 1907.

SIR: I have the honor to submit the following report of the constabulary school for the year ended June 30, 1907. The course adopted by the school staff for the instruction of student officers and enlisted students the past year included the following subjects:

For student officers: Small-arms firing regulations, including a course in gallery practice; infantry drill regulations, theoretical and practical, to include school of the company and battalion parade; manual of guard duty, theoretical and practical; equitation, theoretical and practical; fencing with saber, foil, and bolo; gymnastics and calisthenics; Spanish and Tagalog languages (primary), for all except Filipino student officers; (instruction in English for Filipino student officers was introduced during the term January to May, 1907); constabulary orders and regulations; constitutional law; McKinley's Instructions to the Philippine Commission; municipal and provincial code; acts of the

^a A number of tables showing the following information have been omitted and are on file in the Bureau of Insular Affairs, War Department: Roster of officers and stations; work accomplished; strength and efficiency of municipal police; and distribution of constabulary force in the district.

Commission affecting the constabulary; penal code with lectures on criminal law, evidence, and procedure; law of arrests; miscellaneous lectures on selected subjects by heads of bureaus; typography and map reading; lectures by medical officers on diseases, first aid to wounded, sanitation, and hygiene.

For enlisted students: Small-arms firing regulations; infantry drill regulations, theoretical and practical; manual of guard duty; bolo fencing; gymnastics and calisthenics; constabulary orders and regulations pertaining to enlisted men; company records and correspondence; arithmetic, geography, reading, and composition in primary English.

The student officers and enlisted students were given ten days' field work in December and three days in May. The period of field instruction for the term ending May 31 was curtailed on account of the early graduation of the student officers.

The organizations on duty at the school during the past year were a class of student officers from July 1 to December 31, 1906, and a class of student officers from January 1 to May 31, 1907. The total number of officers instructed in these two classes being 42.

Three different companies of enlisted students were under instruction during the year, the total number of enlisted men instructed being 168, of whom 107 qualified.

These companies, while undergoing the usual instruction generally given to organizations, have been employed as guards at the school at constabulary headquarters, and over the powder magazine at San Juan del Monte; as escorts to prisoners from Billbid to the penal colony at Iwahig and various points in the provinces, and to a considerable extent over laboring prisoners in the city of Manila.

They have received no target practice, no range being available. All of the companies have suffered more or less on account of not having permanent and efficient company commanders the past year. It was found necessary from time to time to detail with them student officers for duty, who as a rule were lacking not only in experience but also in enthusiasm, as this company work could be nothing more than temporary duty, performed during the time they were engaged in hard study.

General Orders, No. 26, bureau of constabulary, series 1907, changed the enlisted personnel at the school, and attached the enlisted students to the companies stationed here. This makes it necessary that each of these companies have assigned to them an experienced company commander of tact and ability, who will be of service as an instructor for the enlisted men and improve the morale and discipline of the company. It should be an established policy to retain these officers at the school when the companies are replaced by others, unless the companies brought to the school have commanders equally as good or better.

If the school course is to be of any benefit to the enlisted men sent here for instruction, the permanency of these particular company commanders is of vital importance. Each company should also have attached to it an officer who could go with it from the school to the field if necessary, and who would know what instruction the company has had under the experienced officer, and be able to continue this course of instruction or improve upon it if his ability has been increased by his experience.

There has been a lack of instructors during the year, and there is now, thus requiring the director or superintendent to act as such to the detriment of the purely administrative work. At present there are but two instructors for the student officers, one of those being the superintendent.

A casual detachment for the handling of all casual enlisted men passing through Manila and arranging for the departure of all vagrants and indigents from the islands to the United States has been maintained under charge of the supply officer and a student officer.

MEDICAL ORGANIZATION.

A dispensary containing a small stock of medicine and the necessary cots is maintained at the school under charge of the superintendent, medical division. Only minor cases are treated therein, and it will be ample in its present condition for all purposes so long as the school is in Manila, conveniently located near the civil hospital.

IMPROVEMENT OF BUILDINGS.

During the past year a gymnasium was arranged out of the old forage shed. Fireplaces and a cement floor were installed in the enlisted men's kitchen; a band room and a barrack room were constructed in one of the main buildings used as a stable. Minor repairs are being made to the offices, officers' quarters, and stables. No material addition has been made and none is recommended in consideration of the contemplated change to the site at Baguio.

RECOMMENDATIONS.

That an officer capable of performing the duties of adjutant and instructor of student officers be assigned to the school as soon as possible; that when the student company is discontinued at the end of August the officer now in command be assigned as instructor of student officers; that two additional officers, experienced, capable, tactful, in fact excellent company commanders, be placed in command of the two companies stationed here; that there be one other officer with each of these companies at all times in addition to the company commanders; that the companies be equipped with the modified Krag carbines, and that 80 additional modified Krag carbines be added to the permanent equipment of the school for the use of student officers and enlisted students. Whenever the companies are removed from the school the companies replacing them should be equipped with the new arms. Only men of intelligence and with some education should be sent to the school as enlisted students. With the addition of three officers to the personnel of the school, the superintendent can attend to general administration, and at the same time perform his duties as member of the officers' examining board.

Very respectfully,

CHARLES J. KINDLER,
Superintendent of School.

EXECUTIVE INSPECTOR, BUREAU OF CONSTABULARY,
Manila, P. I.

REPORT OF CHIEF SUPPLY OFFICER.

HEADQUARTERS PHILIPPINES CONSTABULARY,
OFFICE OF THE CHIEF SUPPLY OFFICER,
Manila, August 5, 1907.

SIR: I have the honor to submit the following report covering the operations of this office for the year ended June 30, 1907:

DUTIES.

This office is charged with the general supervision of the five divisions through which the bureau is fed, clothed, armed, equipped, quartered, and paid; with providing, through the medical division, for medical attendance, treatment, and supplies for its officers, enlisted men, and employees; with the preparation of the annual estimates for appropriation and the accounting for funds appropriated for the maintenance of the bureau, and with the drafting from time to time of orders and regulations intended to improve its fiscal organization and administration.

Three important changes, affecting the efficiency of the organization as a fighting machine, its accounting system, and its cost, have been made during the year:

1. The rearming of the enlisted personnel with the United States magazine carbines, and later equipping this arm with a bayonet.
2. The complete revising of the method of clothing the enlisted men; and
3. The sale of the Benguet stage line.

The first of these changes gives the organization a modern repeating weapon, light in weight, and the advantage of having a bayonet to withstand bolo rushes. This work is half done and funds are available to complete it.

Since the organization of the bureau the method of issuing and accounting for clothing has caused considerable dissatisfaction, due mainly to the fact that no authentic audit of these accounts could be made. For this and other obvious

reasons it was considered advisable to change the clothing allowance, giving each man on his enlistment ₱42 credit, selling the clothing direct to him and making a settlement with him at the time of his first payment. With this ₱42 his company commander is charged with seeing that a proper outfit of clothing is purchased. Thereafter, and until his discharge, he is entitled to a quarterly allowance of ₱9, which is paid to him at the end of the quarter. Within this amount any uniform clothing desired may be bought by him, but clothing purchased in excess of the allowance is charged directly against his pay.

This system allows a clean-cut method of accounting, whereby no balance is due either the man or the government after each payment, and a thorough audit by the insular auditor, and encourages the man in the care and preservation of his clothing.

The third change, the sale of the Benguet stage line, has removed an incubus from the shoulders of the bureau. This stage line was originally installed to open communication with and encourage travel to Baguio. Although this bureau was charged with its maintenance and operation, and the expense connected with it was borne by our appropriation, other branches of the government derived quite as much benefit perhaps from its operation. The fare charged each passenger, ₱20, by no means paid for its maintenance, and for the last six months of its existence under the control of this bureau it was operated at a net loss of ₱16,330.20, not including wear and tear on rolling stock and equipment and deterioration of animals. The loss for the fiscal year 1906 was ₱34,718.40.

It was, then, with a feeling of relief that the operation of this stage line was in February last transferred to C. M. Jenkins. Mr. Jenkins bought of us 35 mules and what other transportation he needed to complete his equipment, for ₱12,000, and was granted a subsidy of ₱1,600 per month for eighteen months, or until such time as a shorter means of communication should be established.

• FINANCIAL.

The appropriation for the fiscal year 1906 as provided in acts Nos. 1416 and 1478 aggregated ₱3,744,121.36; of this amount there remained on hand on June 30, 1906, ₱151,496.62; and undrawn in the treasury, ₱196,278.51, making a total of ₱347,775.13.

Against this amount, however, there were outstanding liabilities practically covering it. The entire appropriation for the bureau during the fiscal year 1907, as provided in acts Nos. 1527 and 1660, aggregated ₱3,151,800, of which there remained on hand June 30, 1907, ₱150,449.18; and undrawn in the treasury, ₱88,669.55, making a total of ₱239,118.73.

As at the end of the preceding year, the bureau had outstanding liabilities practically covering this surplus.

Following is a statement of the financial operations of the bureau for the year:

On hand June 30, 1906.....	₱151,496.62
Undrawn in the treasury June 30, 1906.....	196,278.51
Appropriated in acts Nos. 1527 and 1660.....	3,151,800.00
Total credits.....	3,499,575.13
Disbursed during the year (including outstanding obligations from last year).....	3,251,436.40
Undrawn in treasury June 30, 1907.....	88,669.55
Losses from defalcations.....	9,020.00
On hand June 30, 1907.....	150,449.18
Total debits.....	3,499,575.13

Included in the amount shown as disbursed during the year are the following items, which do not properly belong to our current appropriation:

Construction permanent barracks and quarters.....	₱88,568.01
Pensions	1,420.20
Transportation of commissary stores.....	9,825.33
Total.....	99,813.54

Deducting this amount from our total expenditures during the year and dividing the result so obtained by the average number of officers and enlisted men, 5,128, the per capita cost of the constabulary during the fiscal year was ₱614. This includes ₱347,775.15 of outstanding obligations carried over into and paid during the present year.

PAYMASTER'S DIVISION.

This division, under the supervision of Capt. A. H. Thomas until June, and then under Lieut. W. C. Kruegel, is charged with paying the salaries of all officers and clerks in the bureau and the wages of skilled and unskilled employees of the bureau in this city; with the payment for all supplies delivered under contract or purchased in open market; with the payment of all transportation bills to the various common carriers in the islands, and with supplying funds to the different district and provincial supply officers.

During the year, as shown by the detailed report of the acting paymaster herewith, a total of ₱1,300,211.02 was disbursed, and ₱1,738,291.17 was transferred to the different supply officers. This shows an increase in disbursements over last year of practically ₱90,000 and a decrease in transfers of ₱775,000. The system adopted at the close of the last fiscal year of paying all officers and clerks of the bureau on unsigned pay rolls by check, the numbers of which are inserted on the roll instead of the creditors' signatures, has been most satisfactory, lessening the amount of labor involved, and in general insuring the more prompt payment of all officers and employees regardless of where stationed. It has lessened the district supply officers' work to such an extent that they are frequently available as examiners and instructors for our new supply officers.

QUARTERMASTER'S DIVISION.

One of the most important duties of this office, affecting as it does the mobility of the organization, is the transportation of our personnel and supplies. The cost of this item of our appropriation is second only to the salaries and wages of the personnel. This branch of the work, together with receiving and caring for supplies, has been in charge of Capt. A. C. A. Bortels, whose detailed report is forwarded herewith. At the close of this year this officer, to enable him to take his accrued leave, was relieved from duty by Capt. Thomas Carl.

During the year it has been our endeavor to obtain as many of our supplies as possible from the insular purchasing agent. Three hundred and forty-four requisitions have been made on that officer, which have been generally filled with sufficient promptness to meet the needs of our service. Two contracts for supplies were let during the year—one for mineral oil, of which the bureau uses some 25,000 gallons per year, and the other for khaki cloth, used in making enlisted men's uniforms. In addition to supplies received upon requisition from the bureau of supply and purchases under contract, it has been found necessary, in order to meet emergency requirements, to make 269 open-market purchases. These, as a general rule, are supplies urgently needed at some remote station, where a requisition on the bureau of supply could not be filled in time to be shipped on a certain boat. The amounts involved in this class of purchases, however, are generally small. At times it has been found necessary to call upon the Quartermaster and Medical Departments of the United States Army to assist us in filling rush orders. These branches of the Federal Government have responded with uniform promptness and courtesy, and have been of material help in efficiently supplying the wants of the bureau.

The close of this fiscal year shows that we have reduced our stock in the quartermaster's division by ₱125,984.43. On June 30, 1907, there remained on hand property to the value of ₱258,767.85.

The subsidizing by the government of certain interisland vessels has contributed probably as much as any one thing to the general welfare of the bureau. Where formerly shipments were made at irregular and unknown intervals, we now have a definitely fixed communication with even our most remote, outlying stations. This has made the carrying of large stocks in the various provinces unnecessary. It has enabled the bureau in many cases to supply the provinces direct from Manila. On account of the superior facilities the quartermaster has for storing and caring for clothing and other supplies, this is a most economical measure wherever it can be carried out.

Under present agreement Billbid Prison makes our uniforms at ₱0.85 per suit, this bureau furnishing the necessary khaki only. The uniforms are well made and no complaint has been submitted.

The hire of cutters and launches from the bureau of navigation is one of our largest items of expenditure. The smaller our force the greater, within a limit, the necessary expenditure for transportation. To cut down on water transportation in general means to cut down efficiency.

Land transportation in Manila, which during the fiscal year 1906 cost the bureau ₱14,100, was last year reduced to ₱7,188.

A saving of ₱23,356.67 was made on imported forage. This was made possible by the sale of 35 mules of the Benguet stage line and the general policy of using palay and grass wherever it could be obtained cheaply and without incurring the risk of surra and other diseases of the native stock of the islands.

An itemized statement of the operations of this division is shown in the quartermaster's report herewith.^a

MEDICAL DIVISION.

This division was under the supervision of Capt. Thomas C. Walker until May 5, 1907, when he resigned on account of ill health. Captain Walker was relieved by Capt. Samuel C. Gurney. Medical attention is furnished all branches of the civil government when other medical officers are not available.

As will be seen by the reports of these two officers, ₱8,349.38 worth of supplies were purchased during the year, of which almost one-half remained on hand June 30.

The hospitals mentioned in our last report have been continued with two exceptions—Catbalogan, Samar, and Zamboanga—the former of which was given up last September on account of our not having a sufficient number of surgeons to supply the needs of the bureau at this and other points, and the latter in December, on account of the proximity to the military hospital at that point and the urgent need of the services of the surgeons elsewhere. During the month of May, with 7 companies of constabulary in the field, and the only point where medical attendance was available being some distance from the provincial capital, it was found necessary to reopen the hospital at Catbalogan, which at the close of the year was well equipped and doing excellent service.

This division at the close of the year had a personnel of 13 officers and 57 enlisted men. The number of enlisted men would not be sufficient to supply the wants of the service if it became necessary for all or many of our companies to take the field at the same time. There should be 1 trained "practicante" for each company, or a total of 100. This would increase the enlisted personnel by 43 men, but it is earnestly recommended.

During the year the general health of the entire bureau has been very good, as shown by the detailed reports of Doctors Gurney and Walker herewith. The medical division has efficiently carried out during the year the object for which it was organized.

ORDNANCE DIVISION.

This division at the beginning of the year was under the supervision of Capt. J. R. Schultz, but shortly thereafter was consolidated with the commissary division and placed under the supervision of Capt. Asa F. Fisk. The repairing and manufacturing plant was abolished and the work of repairing arms and equipment was turned over to the Manila ordnance depot of the United States Army. This branch of the Federal Government has promptly answered every call made upon it, and we acknowledge our indebtedness to Maj. Charles B. Wheeler, chief ordnance officer, Philippines Division, U. S. Army, for his efficient help during the year.

Authority has been granted to rearm our entire organization. Two thousand four hundred and twenty of the new United States magazine carbines, caliber .30, have been purchased, of which 1,615 have been remodeled to carry the bayonet. At the close of the year 2,120 of these new arms were in the hands of the various organizations, as shown by Captain Fisk's report. It is expected that before the end of the present calendar year the process of re-

^a A number of the tables referred to have been omitted and are on file in the Bureau of Insular Affairs, War Department.

arming will have been completed and our organization armed with a modern repeating rifle. During the year 1,746 Springfield carbines, 58 Winchester shot-guns, and 2,200 revolvers were cleaned, repaired, and reblued at the Manila ordnance depot, at an average cost of ₱1.60 per arm.

This division during the year manufactured articles of equipment, such as bridles, belts, etc., aggregating a value of ₱1,500.

COMMISSARY DIVISION.

This division early in the fiscal year was consolidated with the ordnance division and placed under the supervision of Capt. Asa F. Fisk, whose detailed report of its operations is submitted herewith. As will be seen by reference thereto, 14 commissaries have been completely closed out during the year, leaving only 10 still in existence. The stock on hand in the provinces at the beginning of the fiscal year has been reduced by ₱29,163.22, leaving on hand therein at the end of the year ₱16,154.50. Of the 10 remaining commissaries, those of Benguet, Antique, and Tayabas are practically now sold out, and following out the general policy of this office the remaining 7 will be closed out as rapidly as commercial enterprises can supply the necessary foodstuffs to government employees in remote stations. The actual loss by deterioration was ₱1,564.33. The entire loss, however, including ₱1,200 in a defaulting officer's accounts not secured from the bond company, was ₱8,136.60. This loss is due to the selling at reduced prices of the remnants of stock in the 14 branch stores closed out during the year. As the commissaries remaining in operation are in remote stations, where the cost of transportation represents a considerable item of the expense (transportation to Bayombong being 34.58 per cent of the entire cost of supplies), we shall continue to operate these remaining stores at a loss until all are closed out.

The consolidation of the duties of the commissary division and the ordnance division into one, in charge of Capt. Asa F. Fisk, has given one more much needed captain to the line, and has resulted in no decrease in the efficiency of the management of these two divisions.

SUPPLY OFFICES.

The remarks in the last annual report under the heading "Supply officers" still obtain. In the fiscal year ending June 30, 1906, it was found possible to reduce the number of supply officers from 52 to 35. The end of the fiscal year 1907 found us with 38 supply officers, this increase of 3 being due to the fact that some of our more experienced officers are on leave and it has been necessary to utilize inexperienced men and give them smaller responsibilities. The total cost of extra compensation to these officers, however, has not been increased during the year.

It is with regret that two cases of malfeasance in office were recorded during the year, both of which occurred with men long in the service and considered thoroughly trustworthy. Their prompt detection resulted in the imprisonment of one and the death by suicide of the other, proving that the inspecting branch of the service is not being neglected. It has been deemed advisable, however, to keep a thorough record of all examinations made by both district auditors and inspecting officers of this bureau, so that no officer's accounts will remain unexamined more than three months.

The present system of checking can hardly be improved upon. With accounts passing through this office and being inspected by officers thoroughly cognizant of the duties of a supply officer, with the cash and deposit verified at the end of each month by the senior inspector or some other reliable officer of the government, and with the quarterly examinations of the accounts by the district auditor no peculations or errors can go long undetected.

ROUTINE WORK.

That the passing of each supply officer's accounts through this office before going to the auditor, as noted in the last annual report, results in a more economical and efficient service, is indisputable. By this means the supply officer is promptly notified of any errors in his accounts, his district director notified of any purchases being made of supplies which can be obtained at less cost here; above all we get a prompt and correct abstract of every expenditure, an absolute essential in keeping a correct account of our assets and liabilities.

GENERAL REMARKS.

There was actually appropriated for the bureau of constabulary for the fiscal year 1906 ₱3,744,121.36. Besides this the bureau of navigation gave us free transportation costing ₱150,000, so that in reality there was appropriated for the bureau of constabulary for the fiscal year 1906 ₱3,894,121.36. For the fiscal year 1907 there was appropriated ₱3,151,800. Out of this we have paid all of our obligations to the bureau of navigation, have in part rearmored the constabulary, and have on hand funds available to complete this rearmament. We also paid ₱79,000 for shoes that we expected at the time of the last annual appropriation to sell to the army, and had on hand at the end of the fiscal year funds sufficient to meet all outstanding obligations.

This reduction of ₱742,321.36 from the expenditures for the previous year was obtained by reducing the stock of clothing and other supplies on hand in our store rooms in this city, by a slight reduction in the enlisted strength, and above all by the careful pruning of the small expenditures in all of our 200 or more stations. These economies, while seemingly small in each case, were large in the aggregate.

Our total refunds for services and supplies to the insular treasury for the fiscal year 1907 amounted to ₱85,947.96.

The system of bookkeeping introduced by Capt. A. J. Robertson, assistant chief supply officer, graphically disclosed the rise and fall of expenses under the 79 subheads he maintained, enabled us at once to check any apparent extravagance, and by instituting a series of comparisons in relative expenses apparently imbued all officers with a purpose to help us to make good our promises to the Commission at the time of the passage of the last appropriation act that there should be no deficiency bill presented on the part of the bureau of constabulary for the fiscal year 1907. The Commission has since gracefully recognized Captain Robertson's efficiency by giving him the rank of major.

That the bureau has been promptly and well supplied so far as its means would allow is due to the efficient organization of the different divisions and to the earnest cooperation of their chiefs.

Respectfully submitted.

MARK L. HERSEY,
Chief Supply Officer.

The EXECUTIVE INSPECTOR, BUREAU OF CONSTABULARY,
Manila, P. I.

BUREAU OF CONSTABULARY, OFFICE OF THE PAYMASTER,
Manila, P. I., July 29, 1907.

SIR: I have the honor to submit herewith my report for the fiscal year ended June 30, 1907.

DUTIES.

This office, under direction of the chief supply officer, is charged with obtaining from the insular treasurer, upon requisition, as needed, moneys appropriated for the bureau of constabulary; with the transferring, in cash or by deposit in the insular treasury, of funds necessary for disbursement by the various supply officers; with the paying of all officers and civil-service clerks in the constabulary; of all per diem and reimbursement vouchers of the first district, and of all other obligations incurred for supplies furnished and services rendered the bureau; and with the accounting to the insular auditor, in accordance with law, for all funds handled by this office.

In June Paymaster A. H. Thomas was granted leave of absence to visit the United States. In order that he might have proper time for the settlement of his accounts before leaving, the undersigned was appointed acting paymaster on May 17, 1907. The present report is therefore practically only a review of the work of my predecessor, on whom too much praise can not be bestowed for his painstaking care in the gathering and preservation of the records of this office.

TRANSFERS.

During the fiscal year 378 transfers were made to supply officers, of which ₱1,191,495.65 was by deposit and ₱546,795.52 by cash, making a grand total of ₱1,738,291.17. Transfers by cash are usually made by boxing the money

securely and then turning it over to the quartermaster for shipment, but at times it has been found more convenient to remit by registered mail to a few supply officers who are stationed in ports which are at periods during the typhoon season storm bound. Packages sent by registered mail are always insured as a guaranty against perils of the seas, risks of fire, robbery, etc. In a few instances checks have been sent direct to the supply officers for the amounts of transfer, but this course has only been followed in cases where the supply officers were not in possession of check books. This, however, has happened very rarely and only in the early part of the year when the provincial treasurers were plentifully supplied with cash, owing to income from cedula taxes, etc.

Transfers to supply officers are, as a rule, completed by the 25th of the month preceding that for which the funds are needed. It is the policy of this office to have the funds in the hands of supply officers before the 1st of the month for which payment for subsistence is to be made, the adoption of which course also allowing prompt payment of pay due for previous month, but some supply officers are prone to defeat their ends by delaying to mail their requisitions until the last moment, causing not only great inconvenience to themselves, but also to this office.

One point in the matter of transfers well worthy of note is that, whereas in the fiscal year ended June 30, 1906, the total of transfers amounted to ₱2,515,561.83, of which ₱1,981,679.63—a little more than 78 per cent of the total—was by deposit during the present year, of ₱1,738,291.17 transferred, only ₱1,191,495.65—but 67 per cent of the whole amount—was by deposit, a decrease of 11 per cent in deposits in relation to total amount of transfers for fiscal year 1907, as compared with the previous fiscal year. This in spite of the fact that the supply of ready money in the provinces has been and is increasing steadily. The change from a heavier to a lighter weight coinage, making it compulsory for provincial treasurers to remit the old coins to the insular treasury, may account for a part of this decrease in deposits as compared with the total amount of transfers, but not for the whole, especially as the change of coinage referred to only became effective during the latter part of the present year.

PAY ROLLS.

On July 1, 1906, the payment of all officers and civil-service clerks of the constabulary was turned over to this office, initiating a system not only more beneficial to the officials themselves, but of inestimable value to this bureau in the completion of its records. Under the system previously in vogue, that of payment by district supply officers, records were too scattered, and if headquarters desired information regarding payment made to a man after a lapse of some time it was found necessary in many cases to obtain the desired data from the auditor's office.

For convenience in checking and recording, the following 14 separate pay rolls are made out by this office:

1. United States army officers.
2. Assistant directors and majors and senior inspectors.
3. Staff.
4. Inspectors and captains.
5. Inspectors and first lieutenants.
6. Inspectors and second lieutenants.
7. Inspectors and third lieutenants.
8. Subinspectors.
9. Medical division.
10. Extra compensation to supply officers.
11. Civil-service clerks.
12. Permanent agents.
13. Supply officers' clerks.
14. Messengers.

In the preparation of these rolls, averaging a total of ₱68,000 monthly, the utmost care is taken, the data which has been systematically recorded as received being checked with an independent list of changes furnished this office by the executive inspector toward the end of each month.

Work on the rolls is commenced soon after the 20th of each month, and from this date to the end of the month nearly the whole time of the office is given

to their preparation and other work pertaining thereto. Checks are mailed promptly on the last day of each month and are in the hands of those concerned shortly thereafter.

An address book is kept carefully and strictly up to date and, considering the poor mail service in many parts of the provinces, the little delay in the transmission of checks is a matter of growing satisfaction. This office considers the keeping of these addresses accurately and to date as an absolute essential to the success of this system of payment, and from the beginning of the financial year no blame has been attached to this office for the loss or delay of a pay check.

The expenditure on the 14 pay rolls above cited has amounted during the fiscal year to the sum of ₱833,102.58.

PAYMENTS.

In addition to the usual transfers of funds and payments involved in the pay rolls, there falls on this office the payment of vouchers for supplies furnished and services rendered. It has been the object of the undersigned during his short term of duty in the position of acting paymaster to profit by the example of his predecessor in the careful and prompt payment of commercial and other obligations upon the rendition of properly approved vouchers.

During the last fiscal year 314 per diem and reimbursement vouchers, aggregating a total of ₱7,642.67, were paid by this office as received from the different officers of the first district. While the total of this expenditure is comparatively insignificant, it is necessary to take into account the fact that it represents payments from January 1, 1907, only, and a better idea of the volume of work involved may be gained by stating that the expenditure named covers considerably more than one-sixth of all vouchers paid during the same period of the year.

Three thousand three hundred and six vouchers, aggregating ₱1,300,211.02, were paid during the fiscal year. While this is not as many as were paid during the previous year, there is a total increase of ₱90,000 actually expended on vouchers. It should be mentioned in this connection that, although the pay rolls are only represented by 14 vouchers monthly, they pertain to the payment of about 400 salaries, to which individual attention has to be given in respect of deductions under various heads, and which often necessitate explanatory correspondence.

CORRESPONDENCE.

The communications both sent and received by this office have materially increased during the year as a natural result of the growing business passing through its hands.

The pay rolls, involving promotions, deductions, refunds, etc., have greatly swelled the number of letters sent. It is only reasonable that each one should wish to be notified of any deduction from pay and the cause thereof, and it has therefore, been the practice of this office to transmit invariably to the person concerned the necessary explanation with his pay check.

CHANGES.

By far the most important change that has taken effect during the present fiscal year is the one made in act No. 1478, Philippine Commission, permitting the continuance of an appropriation under various subheads from any one fiscal year into the following, not as a supplemental account for that year, but simply as an increase for that year's appropriation. This has revolutionized the system of accounting, being far more convenient through its pliability, not only in regard to bookkeeping, but in so far that it allows considerable latitude in transferring a balance from one subhead to another.

Act No. 1527, Philippine Commission, dated August 18, 1906, authorizes only the following subheads:

Administrative expenses, bureau of constabulary; services and supplies, bureau of constabulary; commissary stores, bureau of constabulary; constabulary relief fund, section 11, act No. 619; constabulary relief fund, section 14, act No. 619.

This consolidated all the subheads—"pay," "clothing, camp, and garrison equipage," "barracks and quarters," "transportation," "secret service," "sub-

sistence," and "contingent expenses" under the one subhead "administrative expenses." This office has, however, for the sake of convenience carried two main subheads, "salaries and wages" and "contingent expenses."

Attention is invited to the tabulated statements hereto appended ^a in which the office work in detail is more fully shown.

Respectfully submitted.

W. C. KRUEGEL,

Acting Paymaster, Philippines Constabulary.

The CHIEF SUPPLY OFFICER, BUREAU OF CONSTABULARY,

Manila, P. I.

BUREAU OF CONSTABULARY,

OFFICE OF THE QUARTERMASTER,

Manila, July 29, 1907.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1907:

DUTIES.

The quartermaster division which is conducted under the general direction and supervision of the chief supply officer, bureau of constabulary, was charged with various duties, the principal of which are:

1. The receiving, inspecting, accounting for, and preserving of all quartermaster's supplies purchased by the chief supply officer upon estimates submitted by the quartermaster.
2. The proper distribution of such supplies to the various district and provincial supply officers and the medical officers stationed throughout the islands.
3. The providing of transportation for officers, enlisted men, and employees, and the shipping and providing of transportation for not alone quartermaster's supplies but also all supplies of the commissary division, the ordnance division, the paymaster division, and the medical division.
4. The providing of transportation for passengers and freight of all bureaus and officers of the government of the Philippine Islands over the Benguet road.
5. The settlement and preparation of vouchers for all bills covering persons transported on "transportation requests," of freight carried on "bills of lading," including not alone such "requests or bills of lading" issued by the quartermaster but also those issued by the various supply officers in the provinces.

CITY TRANSPORTATION.

During the fiscal year all land transportation needed by the constabulary was hired from the city of Manila, as may be seen from the following table:^b

This transportation was used in hauling supplies to and from railway depot, to and from vessels in the Pasig River, and to and from our lighter. The carromatas were used for necessary transportation of officers and employees. In the last annual report the hope was expressed to hold the cost of city land transportation for the fiscal year ended June 30, 1907, within ₱10,000. From above table it will be seen that even better results were obtained, the cost having been but ₱7,188.34 for the year.

The service rendered by the city was quite satisfactory.^c

In the above table is not included the forage shipped by the bureau of supply, the amount and cost of which, including transportation from Manila to the nearest port or railway station, was ₱71,495.13.

Last year the total cost was ₱94,852. Therefore it will be seen that this year we spent ₱23,356.67 less for imported forage than we did last year. However, it must be borne in mind that in February, 1907, we sold to Mr. C. M. Jenkins 35 mules, thus reducing the demand for imported forage to that extent.

^a These statements have been omitted and filed in the Bureau of Insular Affairs, War Department.

^b This table has been omitted and filed in the Bureau of Insular Affairs, War Department.

^c A table showing shipments made during the fiscal year has been omitted and filed in the Bureau of Insular Affairs, War Department.

In the above figures is not included the grass, palay, etc., purchased by supply officers in the provinces, nor the cost of transporting forage from ports to inland stations.

MEANS OF LAND TRANSPORTATION.

The following table, compiled from the latest property returns, shows the means of transportation owned by the bureau of constabulary:^a

WATER TRANSPORTATION.

From the following table it will be seen that the cost of hiring cutters and launches from the bureau of navigation during the year amounted to ₱96,289.85, as against ₱112,460 during the preceding year, a decrease of ₱16,170.15.^b

PASSENGERS.

The following table shows the number of transportation requests issued during the year by the quartermaster and supply officers in the provinces, together with the number of first, second, and third class fares, and total cost:

By—	Fares.			Number transportation requests issued.	Amount paid.
	First.	Second.	Thrd.		
Interisland boats.....	450	14	2,892	1,262	₱30,836.46
Railway.....	1,036	110	2,694	1,316	3,971.00
Total.....	1,486	124	5,586	2,578	34,807.46

All bills for the transportation outlined in the above table have been settled by this division.

BENGUET STAGE LINE AND FREIGHT SERVICE.

The following tariff of charges, etc., for the transportation of passengers on the stage line between Dagupan and Bagulo, and for the transportation of government supplies over the same route was in force during the fiscal year ended June 30, 1907:^c

EXTRACT FROM CIRCULAR 33, JUNE 30, 1906.

* * * * *

FARES.

[Direct.]

Up.		Down.	
Dagupan to Twin Peaks.....	₱10.00	Bagulo to Twin Peaks.....	₱10.00
Twin Peaks to Bagulo.....	10.00	Twin Peaks to Dagupan.....	10.00

INTERMEDIATE POINTS IN EITHER DIRECTION.

A.

Between Dagupan and Mangaldan.....	₱1.60
Mangaldan and San Jacinto.....	.60
San Jacinto and Manoag.....	1.20
Manoag and Pozorubio.....	2.20
Pozorubio and Twin Peaks.....	4.40
Total Dagupan to Twin Peaks or return.....	10.00

^a This table has been omitted and filed in the Bureau of Insular Affairs, War Department.

^b A table showing this in detail has been omitted and filed in the Bureau of Insular Affairs, War Department.

^c A table showing freight charges and data containing regulations covering free transportation and passengers' baggage has been omitted and filed in the Bureau of Insular Affairs, War Department.

B.

Between Twin Peaks and Camp Four-----	P3. 70
Camp Four and Bagulo-----	6. 30
Total Twin Peaks to Bagulo or return-----	10. 00
* * * * *	

The following financial statement shows that during the six months ended December 31, 1906, the stage line was operated at a loss to this bureau of ₱16,330.20.

COST OF OPERATIONS JULY 1, 1906, TO DECEMBER 31, 1906, INCLUSIVE.

Salaries and wages, and incidental expenses-----	P11, 145. 67
Forage and incidental supplies-----	10, 457. 39
	21, 603. 06

RECEIPTS.

Miscellaneous collections by quartermaster, Philippine constabulary-----	P30. 00
Collections as per July report of Lieutenant Ashe-----	615. 00
Collections as per August report of Lieutenant Ashe-----	702. 35
Collections as per September report of Lieutenant Treadaway-----	767. 83
Collections as per October report of Lieutenant Treadaway-----	677. 79
Collections as per November account of Lieutenant Treadaway-----	1, 111. 37
Collections as per December account of Lieutenant Treadaway-----	1, 368. 52
	5, 272. 86
Loss during the six months of operation-----	16, 330. 20

It was not believed fair that the constabulary should be charged with this business and continue to lose large sums out of its otherwise small enough appropriation. Upon the urgent recommendations of the chief supply officer, concurred in by the director of constabulary and the honorable the secretary of commerce and police, the Commission, after advertising for bids, authorized the sale of the stage-line business, including most of the property, to Mr. C. M. Jenkins, of Dagupan and Bagulo. After a contract between the government and Mr. C. M. Jenkins had been properly executed, the stage line was finally turned over to the latter on February 22, 1907. By selling the stage line we also gained the release of about ₱14,000 worth of property, consisting mostly of live stock, vehicles, harness, etc., that were badly needed in other parts of the islands.

QUARTERMASTER SUPPLIES.

For the sake of convenience property is grouped into ten classes, as follows:

Class No. 1, fuel; class No. 2, forage; class No. 3, stationery; class No. 4, office and barrack furniture and fixtures; class No. 5, means of transportation; class No. 6, tools; class No. 7, horse medicines, etc.; class No. 8, miscellaneous expenditures; class No. 9, clothing and materials; class No. 10, equipage.

Attention is invited to the following table, which gives a fair idea of business done and extent of accountability.

Value of all property on hand on July 1, 1906-----	P384, 752. 82
Value of property received from all sources during the fiscal year ended June 30, 1907-----	175, 143. 79
Total value-----	559, 896. 61
Value of all property transferred to provinces, sold, expended, or destroyed during the fiscal year ended June 30, 1907-----	301, 128. 76
Value of property on hand June 30, 1907-----	258, 767. 85

In the value of property on hand July 1, 1906, and June 30, 1907, are included all articles in use in the offices of the director, chief supply officer, inspecting officers, board room, executive division, paymaster, quartermaster, and in the several storerooms.

The records show that 736 requisitions were received and acted upon during the fiscal year; that 269 open-market purchase vouchers have been accomplished; that 120 purchase vouchers from the bureau of supply and other bureaus have been settled; that 107 transfers have been made by officers in the provinces to the quartermaster; and that the quartermaster has made 998 transfers to supply officers or other accountable officers in the provinces or Manila.

Class 9, clothing and materials, is the most important part of all property, as upon it depends, in a large measure, the discipline and welfare of the enlisted men.^a

REMARKS AND RECOMMENDATIONS.

It having been definitely decided that as soon as the present supply of leggings is exhausted the puttee is to be adopted, and it is respectfully submitted that no more puttees be ordered up from Zamboanga. During the past year 601 pairs of puttees were received by this division from Zamboanga, of which 513 pairs were reshipped to various companies. On June 30 we had 11,917 pairs of leggings on hand, which, judging from past consumption, are sufficient to supply the constabulary for another year and a half. The more puttees we furnish now the longer it will take to use up the supply of leggings on hand.

It may be well to encourage the sale of our leggings to municipal police. Senior inspectors and company commanders probably can do much to help this matter along.

During the year the quartermaster purchased for various companies from "mess savings" quite a number of gold-medal cots. It is respectfully recommended that iron beds with bejuco bottoms, of the kind that 500 have been advertised for, be furnished all companies as soon as our appropriation will stand it. It is believed the government should furnish the enlisted men with some kind of a bed, and that "mess savings," if any, should be used otherwise. As it stands now, if some companies should be situated so unfortunately as to be unable to accumulate sufficient "mess savings" in order to purchase or maintain cots, they will have to do without them.

It is further recommended that if sufficient funds can be made available all companies be supplied with uniform lockers of a pattern similar to a couple that have been on hand in this division for some time.

Very respectfully,

AUGUST C. R. BORTELS,
Quartermaster, Constabulary.

The CHIEF SUPPLY OFFICER, BUREAU OF CONSTABULARY,
Manila, P. I.

BUREAU OF CONSTABULARY,
OFFICE OF THE ORDNANCE OFFICER,
Manila, July 29, 1907.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1907:

The principal feature of the past year's work has been the rearming of the troops with the United States magazine carbine, caliber .30, and the conversion of the carbine into a short rifle. The cost of this conversion has so far averaged ₱3.17 per arm, making the cost of the new arm, remodeled, ₱11.17 and of the cleaned and repaired arm ₱9.17.

The cost of a complete equipment for a soldier is ₱24.08, or ₱22.08. Owing to the scarcity of the new, we will have to purchase 1,770 cleaned and repaired carbines to completely rearm our troops. This will make the total cost of rearming and full equipment ₱137,406.

We have so far paid on this account ₱22,000, which leaves a balance of ₱32,406 to be paid out of the 1908 appropriation, if the total ₱83,000 available by act No. 1660 is applied on this account.

We had on hand June 30, 1906, 300 magazine carbines, and during the year purchased 2,120, making a total of 2,420. Of this number 1,615 have been remodeled during the past six months.^b

Twenty-one field safes received from the provinces, totally unfit for service, have been repaired, repainted, and reshipped, 19 others have been repainted and combinations changed.

^a A table showing clothing handled during the year has been omitted and is on file in the Bureau of Insular Affairs, War Department.

^b A table showing rifles repaired, condemned, and purchased, together with cost of same, has been omitted, and is on file in the Bureau of Insular Affairs, War Department.

The average cost of the repair work by the Manila ordnance depot, per arm, was ₱1.60 for the year.

Captain Schultz estimated (fiscal year 1906) the cost of doing the work ourselves was ₱1.97 per arm, and so there was a saving of ₱0.37 or ₱1,276 on the 3,450 arms repaired. In view of the fact that Captain Schultz figured the total cost of our shops to get the average and that it costs practically ₱4,000 per annum to maintain the small force we employ to care for arms and equipment, handle the shipping, etc., the actual loss has been ₱2,724, which does not include transportation to and from the ordnance depot.

Over and above the repair of arms and equipment of a minor nature, property valued at ₱1,500 has been manufactured by the division.

Since July 1, 50 remodeled carbines have been furnished the first district, 100 sent (Samar) second district for exchange, and 100 to the third district for exchange.

Respectfully submitted.

ASA F. FISK,
Ordnance Officer, P. C.

The CHIEF SUPPLY OFFICER, PHILIPPINES CONSTABULARY.

Manila, P. I.

BUREAU OF CONSTABULARY,
OFFICE OF THE COMMISSARY OFFICER,
Manila, August 3, 1907.

SIR: I have the honor to submit the following report covering the operations of the commissary division during the fiscal year ended June 30, 1907:

Table A shows the purchases, transfers, and sales.^a

STOCK.

In provinces, June 30, 1906.....	₱43,835.43
In transit.....	1,482.29
	<u>45,317.72</u>
In provinces, June 30, 1907.....	12,537.99
In transit.....	3,616.51
	<u>16,154.50</u>
Reduction in stock.....	29,163.22

Fourteen commissaries have been completely closed out during the fiscal year, leaving only 10 still in existence. Of this number Benguet, Antique, and Taya-bas are practically sold out. This leaves Cagayan, Ilocos Norte, Isabela, Lepanto-Bontoc, Nueva Vizcaya, Samar, and Palawan still on the active list, though the latter acts only as a distributor with no losses or deterioration.

SALES.

The sales for the year, ₱88,251.67, cover all special and closing-out sales, so that the actual surcharge of 10 per cent is only available on about ₱60,000, netting ₱6,000 for running expenses.

ASSETS AND LIABILITIES.

Table B shows the assets and liabilities on June 30, 1907.^a

LOSSES.

As will be noted, the loss for the quarter exceeded the surcharge of 10 per cent by ₱8,136.60. This loss, however, includes ₱1,200 in the Walsh defaulting account not secured from the bond companies.

The loss by deterioration was ₱1,564.33, or 2.6 per cent.

^aOmitted, and filed in the Bureau of Insular Affairs, War Department.

TRANSPORTATION.

The cost of transportation was ₱6,165.32, or 10½ per cent on regular sales. The cost of transportation to Bayombong was the highest, it costing 34.58 per cent on stores shipped.

The total losses then were as follows:

Dr.	
10 per cent on ₱60,000 sales.....	₱6,000.00
Loss on previous net earnings.....	8,136.60
Total	14,136.60
Cr.	
Transportation	6,165.32
Loss by deterioration.....	1,564.33
Loss through defaulting account.....	1,200.00
Loss through auction sales, etc.....	5,206.95
	14,136.60

In closing out the stock of the 14 commissaries, valued at ₱29,163.22, the loss has been only ₱5,206.95, or 17.8 per cent.

As will be noted by a glance at Table B, the net surplus or profits on June 30, 1907, amounted to ₱29,435.35.

The total loss of the bureau of supply on our old depot stock since taking over was ₱26,792.42. This included all losses by reduction in prices, auction sales and condemnation.

Even covering these losses, the government had a net profit on the six years business of ₱2,642.93. This on a grocery business run on a 10 per cent margin.

The cost of operation of the few remaining commissaries will be at a loss of probably 15 to 20 per cent during the next year, owing to the heavy cost of transportation, and having no commissaries left where a small profit can be made to offset this high cost to any extent.

Respectfully submitted.

ASA F. FISK,
Commissary Officer, P. C.

The CHIEF SUPPLY OFFICER BUREAU OF CONSTABULARY,
Manila, P. I.

OFFICE OF THE SUPERINTENDENT, MEDICAL DIVISION,
Manila, April 26, 1907.

SIR: Preparatory to availing myself of accrued leave of absence, I have the honor to submit a report of the medical division for the period from July 1, 1906, to April 30, 1907.

The following exhibit shows in detail, exclusive of salaries, the cost of maintenance of the division:

Supplies on hand, July 1, 1906.....	₱3,380.45
Supplies received.....	4,934.52
Total	8,314.97
Supplies transferred.....	6,202.47
Total remaining on hand.....	2,112.50
Rents and contingent expenses.....	2,438.00

As the necessary data will not be available until sometime after the close of the fiscal year, the above tabulation does not include accounts for medicines or medical attention paid by district and provincial supply officers; but there are ample assurances that this will prove even less than last year. It is doubtful whether ever before in the history of an organization of equal size the total

cost of the maintenance of the sick, considering the character of the service rendered, was so exceedingly small. This detail would be further elucidated here, but it now seems sufficiently well established by abundant facts, figures, and experience that the bureau can provide for its sick much more satisfactorily and at considerably less expense to the government than would be possible if this division were administered by an independent bureau or by the military.

However economically it may be found imperative to maintain the division, it is sincerely hoped that during the approaching fiscal year funds will be forthcoming for the purchase of certain essential details of hospital equipment which we do not possess, and which are requisite if thorough, up-to-date work is to be expected of our medical officers. Among the items lacking and most indispensable are microscopes—there are but three in our service—glass operating tables, and modern instruments for capital operations. Our surgeons are well qualified to do advanced professional work, and every encouragement to this end should be extended in so equipping them that they would not be hampered or handicapped should serious operations be required (as is often the case) or epidemics of communicable disease render bacteriological examinations necessary. "Gold Medal" cots, for reasons of economy alone, if for no other, should be replaced by iron spring beds. Experience proves this cot—or any other for hospital purposes—to be expensive at any cost, and it is earnestly recommended that their use in this capacity be discontinued.

SUPPLIES.

Supplies purchased during the period covered by this report, while sometimes limited in quantity, have been of most excellent quality. Few open-market purchases have been made, the bulk of stock being imported from the United States and furnished by the Bureau of Supply. This method has proved advantageous in that drugs and the like are superior manufacture and are furnished at wholesale prices, plus the usual 10 per cent surcharge. On account of this arrangement, however, considerable dissatisfaction on the part of certain local druggists has been often expressed, as to them it seems unjust, heavily taxed as they are, to be compelled to compete with the government, whose imports are largely non-dutiable and can accordingly be sold to the bureau at comparatively low figures. However this may be, as a matter of course it has been incumbent upon this office to buy whenever and wherever it could do so to most advantage.

Constabulary in those provinces where no medical officer is stationed are now furnished only a limited number of such simple medicinal preparations and other remedial agents as the average layman should be able to identify and use intelligently; and this plan has proved economical and efficient as well as quite satisfactory to all concerned. Complaints as to the scarcity of supplies, in so far as this office is aware, are now seldom, if ever, heard.

The new field chest, equipped with such drugs, dressings, instruments, etc., most likely to be required, and constructed as to prove easily transportable, recently introduced, has already demonstrated its indispensability and proved a substantial factor in the promotion of the efficiency of this division. The equipment of a company, if it does not include one, should be regarded as incomplete.

It is recommended—or at least suggested—that these chests, following the rule observed by the army, be used only in the event of field operations or in emergency. For routine garrison use the necessary supplies, as usual, can be furnished direct from these headquarters.

COMMISSIONED PERSONNEL.

At this writing there are in the service 5 surgeons with rank of captain, 1 of whom is superintendent of the division; 5 medical inspectors with rank of first lieutenant; and 3 medical inspectors with rank of second lieutenant. Since last report 1 captain and 3 first lieutenants have resigned and 1 second lieutenant has been dismissed.

Of the 4 vacancies thus created, only 2 have so far been supplied. Two active young physicians, of approved qualifications, character, and habits are needed to fill the remaining vacancies, and these, it is thought, could readily be obtained if proper request were made to the Bureau of Insular Affairs at Washington. And this is recommended.

The value of these officers, not only to the constabulary, but to the various communities where serving as well, has during the past year, been so thoroughly confirmed that extended comment would appear superfluous. Parenthetically it should be stated at this juncture no little of the credit claimed by the bureau of health for apparently ridding the islands of certain forms of epidemic disease—notably smallpox—which the public press has often so loudly praised, might properly be placed where it belongs—with the medical officers of this bureau. From this no inference should be drawn that our doctors claim to have done more than was their manifest duty; they simply contend, and justly so it is thought, that apart from their legitimate duties as officers, they, and men under them, have faithfully cooperated with the insular health authorities in vaccinating thousands upon thousands of the native population, and have rendered immeasurable assistance in the inauguration and successful prosecution of a crusade against preventable diseases, which is responsible for the vastly improved conditions of health and sanitation prevalent in this archipelago to-day.

As proof of service rendered, where the bureau of health has done and continues to do absolutely nothing, witness the following from the last annual report of Governor Knight (Nueva Vizcaya) to the honorable Governor-General:

"The Philippines constabulary maintain a hospital in Bayombong, of which Dr. W. A. Robison, first lieutenant and medical inspector, has charge. As the constabulary force has been cut from 196 to 92 men in the last two years, and the constabulary posts are so distant from the headquarters at Bayombong, the hospital reports do not show many patients. This fact led the constabulary authorities some months since to consider discontinuing the hospital and withdrawing the medical officer. It was, however, brought to their attention that Doctor Robison, as acting president of the board of health without compensation, has done a large amount of provincial work and is the only medical man within four days' journey of Bayombong.

"There is not only not a doctor but not even a druggist or practicante, American or native, in the province, and if a physician were not stationed here the employees of the government would be entirely without medical attendance in cases of emergency.

"As an example of this necessity for a doctor in the province, I will cite the occurrence of an outbreak of smallpox which occurred in June among a company of immigrants from Ilocos Sur. Just after their arrival in Bayombong Doctor Robison was called to see a sick child, whom he found suffering from smallpox. He at once removed the entire company of immigrants to a quarantine camp in a sufficiently remote place and the outbreak was confined to 6 cases and 1 death, all among the immigrants, who were all kept in quarantine until all danger of further spread of the disease was past.

"This is the only outbreak of smallpox in the last two years, due to the good work of our present and former health officer.

"Owing to the remote situation of the province it will be necessary to keep a medical officer stationed here."

During his term of office the undersigned has visited with one exception all the hospitals maintained by the bureau; and in each province most commendatory expressions were heard from leading officials and others as to the great value of these institutions to the community at large and especially to the poor. It is said that the governor of Samar remarked that he regarded the temporary closing of the hospital at Catbalogan as little short of a public calamity.

Further space will not be consumed in the discussion of this particular subject, but the honorable Commission might well be brought to a proper conception of the facts, with a view to securing, if possible, increased pay for our junior medical officers. That the intrinsic value to the commonwealth of the competent physician should be reckoned as at least equal to, if not somewhat above, that of clerks, veterinarians, and inoculators of cattle is self-evident; and it therefore is earnestly and urgently recommended that the annual salary of second lieutenants of this division be increased from \$1,400 to \$1,600, and that of first lieutenants from \$1,600 to \$1,800. This the future will prove of undoubted necessity if an acceptable order of talent is had and retained permanently in service.

ENLISTED PERSONNEL.

At the close of the last fiscal year the enlisted personnel numbered 57, and at the date of this report 56.

The maximum strength of the corps is 57, which is manifestly inadequate. To properly administer our hospitals and meet the requirements of outlying companies and detachments, a corps of no less than 100 is essential.

Medical officers, in enlisting the present force, have striven to secure the best material available, and only such as show a special aptitude for this important branch of the service and give promise after a thorough course of instruction are now accepted.

Many of our "practicantes" largely take the place of medical officers at a number of stations, with results that have been most gratifying and far beyond what was originally believed possible. Their services in the field have been especially meritorious and highly commended by officers and others; and it is a matter of record that through their familiarity with an intelligent application of the principles of first aid to the wounded, human life has been repeatedly saved.

The director of the bureau in his last annual report refers to the special utility of discharged native soldiers, constabulary, and scouts as officers in the municipal police, and states that many are now serving in such capacity, much to the betterment of that organization. As additional proof that the constabulary, in a sense, is an educational force in the islands, it might have been added that a number of our discharged "practicantes" are rendering important service as local health officials.

In order that the service may prove attractive to the more desirable class of men, it is requisite that the pay be somewhat increased. Recently a registered practicante, of several years hospital training and valuable experience, expressed his willingness to enlist if assured of promotion to the grade of corporal within three months, if found available. (It is probably diverting, but he was accepted upon these terms). He remarked—and it is said to be a fact—that the pay and allowances of a private did not equal in amount the salaries offered by the various public hospitals in Manila, and that for qualified men there was at all times an active demand.

The fact should not be ignored that our medical staff is small, not nearly enough doctors to go around, hence the obvious importance of permanently maintaining at remote stations, where they must act, not under the supervision of a medical officer, but upon their own initiative, well trained, well qualified corps men.

By paying a trifle more, say 15 or 20 per cent more than at present, we could soon assemble a corps safely to be relied upon in any emergency likely to arise. It is especially recommended that the pay of sergeants of this division be increased to at least that of supply sergeants.

HOSPITALS.

Because of vacancies in the commissioned personnel, it was found necessary last September to close the hospital at Catbalogan, Samar; and on account of proximity to the military, and the urgent need elsewhere of the surgeon in charge, that at Zamboanga was also discontinued (December 31, 1906). There have been since last report no changes affecting other hospitals and wards, hence it would be repeating to note here the location of each.

It is regrettable that for reasons attributable to lack of appropriation for the purpose all provinces occupied by the bureau can not at this time be afforded home hospital facilities; but where this is true a room for the sick under the care of a trained enlisted man, is usually set apart by the senior officer, and this it has been found proves a fairly satisfactory substitute. Certainly it is an improvement over no provision at all.

District and other surgeons visit these provinces as often as practicable, and such of the sick as can not be properly provided for at their respective stations are transferred, on their recommendation, to the nearest hospital, constabulary, or military.

A number of our hospitals, notably that at Iloilo, being under the necessity of receiving the sick of adjacent provinces, are not infrequently taxed to their capacity, but actual overcrowding has not yet been the rule.

As hospitals, a majority of buildings in use are inadequate and not in that state of repair or originally so constructed as to prove desirable. Where this

is true, in order that the sick may be made as comfortable as possible, it is recommended, even if it should involve a slight increase over what is now paid out in rents, that more appropriate structures be employed. In this connection it is recommended that the plans for the new quarters which, it is understood, are to be erected at various points in the future, be made to include a compartment for the exclusive use of the sick.

An entirely new structure, preferably of reinforced concrete, to be the property of the bureau, is demanded at Iloilo. This, at first glance, may appear extravagant, but the suggestion is not made unadvisedly. And this is obvious when it is considered that notwithstanding an enormous and other heavy incidental expense we are caring for the sick of this and other bureaus in that section (including two or three important islands) at an aggregate cost to the government of several thousand pesos less per annum than would obtain if the same service were rendered by the military or by others. In confirmation of this and for your consideration note the following from Doctor Curney:

"On inquiring at the Presbyterian Hospital I find that they charge ₱2 a day for ward patients. The officials, however, would not entertain for one moment the idea of taking in our sick and wounded, stating it is not the policy of the hospital to fill their wards with paid patients, as it is primarily a charity organization, and this would defeat the object for which the hospital was built.

"On looking up the number of patients in the constabulary hospital during the last quarter I find the following:

	Patients.	Number of days.
July.....	20	365
August.....	25	485
September.....	25	414
Total.....	70	1,264

"This total number of days should be multiplied by 19 centavos, making the amount paid for patients while in the hospital for the last quarter.....

Rent of hospital.....	₱240. 16
Electric light, average.....	300. 00
Total.....	600. 16

"Taking the average total days, 1,264, and multiplying by ₱2, which would be the cost of maintenance of our patients in the Presbyterian Hospital, it comes to the sum of ₱2,528, it being ₱1,927.84 more than the cost of maintaining the soldiers in our own hospital.

"During the month of October, up to the present date, the number of patients has been forty-nine or five hundred and eighty days; these at ₱2 per diem is ₱1,160. So far the twenty-three days of this month we would have to pay the Presbyterian Hospital almost twice as much as it took to maintain our sick and wounded during the past quarter."

Anent the closing of the district hospital, Colonel Taylor, under date of November 4, 1906, writes as follows:

"The only way to be made in dispensing with the hospital would be rent and light. There were over 40 patients at one time last month. The Presbyterian Hospital or the Military hospital would, even if they could take care of our men, charge us far more than it costs us to maintain the hospital. I do not think the suggestion should be entertained."

HEALTH.

Under this caption the following tabulation is given:

Malaria	366
Diarrhea	70
Dysentery	53
Tuberculosis	45
Number of days lost in hospital.....	8, 857
Number of days lost in quarters.....	3, 437

The health of the bureau has been good. The apparent improvement in the effective rate to total strength is to a certain extent no doubt due to the greater care in matters of hygiene and sanitation; but unquestionably the greatest factor is that the various companies have been gradually weeded of their weaklings and chronic invalids. The immature youths and recruits of inherited or acquired weakness of constitution have gradually, after repeated appearance on the sick report, been discharged from the service; and it is believed that the enlisted personnel now more nearly approaches the physical standard prescribed by existing regulations than at any previous period in the history of this organization.

As to the health of officers (American), it, too, has been good. More should take early advantage of accrued leave of absence. The fact has been well confirmed that even the most stalwart and robust after service of two or three years in the Tropics, largely lose energy, strength, and ambition. They perform what work duty demands more or less half-heartedly and with a draft on vital energy that can be actually felt at the time. Slight ailments to which a second thought would not be given in the United States are felt out of all proportion to their severity. No unimportant part of the work of the medical officer consists in treating and judiciously advising this class of cases.

In concluding this report, my last as an officer of the bureau, I desire to especially emphasize the importance of—

1. Filling without undue delay existing vacancies in the commissioned personnel.

2. Increasing the enlisted strength from 57 to 100.

3. Improving the equipment of hospitals.

One other timely recommendation: That upon my successor in office, for obvious reasons, the rank of major be conferred.

I have the honor to be, sir, very respectfully,

Your obedient servant,

T. C. WALKER,
Superintendent, Medical Division.

The CHIEF SUPPLY OFFICER, BUREAU OF CONSTABULARY,
Manila, P. I.

OFFICE OF THE SUPERINTENDENT, MEDICAL DIVISION,
BUREAU OF CONSTABULARY,
Manila, P. I., July 15, 1907.

SIR: I have the honor to forward herewith a supplementary report for the months of May and June of the fiscal year ended June 30, 1907.

Accompanying this report is one by the ex-superintendent of the medical division from July 1, 1906, to April 30, 1907:

Supplies received from Capt. Thomas C. Walker, May 1, 1907.....	₱2,112.50
Supplies purchased May and June, 1907.....	3,414.86
Total	5,527.36
Supplies transferred May and June, 1907.....	2,021.27
	<u>3,506.09</u>
Rents and contingent expenses, April, May, and June.....	483.34
Amount paid out by district and provincial supply officers for medicines and medical treatment from July 1, 1906, to June 30, 1907....	3,275.70

During the past two months requisitions have been sent to the bureau of supply for microscopes, sterilizers, emergency cases, and other articles that are necessary to fully equip the hospitals now in commission.

It was found advisable in the month of May to reopen the constabulary hospital at Catbalogan, Samar. This hospital is well supplied with medicines and surgical appliances, so that all of our sick and wounded men serving in that province can be taken care of by one of our own medical officers.

On June 30 there were two vacancies in the office of second lieutenant and medical inspector. A request has been made to the Bureau of Insular Affairs, at Washington, to fill these vacancies, but up to the present time nothing has been heard concerning them.

Relative to the enlisted personnel, it is now up to its full strength allowed by act No. 1527, Philippine Commission.

The number of enlisted men are not adequate to meet the demands, as there are 100 companies of constabulary and only 57 enlisted men in the medical division. It can be seen at once that it is impossible to supply each company with a hospital corps man, which each company commander and senior inspector is constantly asking for. It is therefore respectfully requested that means be taken to increase the enlisted strength from 57 to 100 men.

The health of the bureau for the past two months has been excellent; there has been no epidemic of dysentery, typhoid, smallpox, or other dangerous communicable diseases. The percentage of venereal diseases is small. All this is no doubt due in a great measure to the better sanitary supervision of the commands by the company commanders and other officers of the line.

Deaths from disease during the past year were about 10 per 1,000. This is quite a remarkable showing when the death rate among Filipinos in Manila during the past quarter was 30.71 per 1,000.

Enlisted men killed during the year 1906-7	28
Enlisted men wounded during the year 1906-7	30
Enlisted men died during the year 1906-7	41
Officers killed during the year 1906-7	1
Officers wounded during the year 1906-7	1
Officers died during the year 1906-7	1

Total 102

Respectfully submitted.

SAMUEL C. GURNEY,
Superintendent, Medical Division.

The CHIEF SUPPLY OFFICER, BUREAU OF CONSTABULARY,
Manila, P. I.



APPENDIX B.

REPORT OF THE SUPERVISING RAILWAY EXPERT.

OFFICE OF THE SUPERVISING RAILWAY EXPERT,
Manila, July 1, 1907.

SIR: I have the honor to submit my annual report of the work of this office for the year ended June 30, 1907.

ORGANIZATION OF OFFICE.

The work of the general force during the year has consisted largely of examinations of proposed routes of railroad lines to be constructed by the Manila Railroad Company under act No. 1510, and by the Philippine Railway Company under act No. 1497.

The following constituted the staff during the fiscal year: Mr. F. A. Molitor performed the functions of supervising railway expert from July 1, 1906, to March 31, 1907, having resigned, taking effect on the latter date.

Mr. L. F. Goodale assumed charge of the office as supervising railway expert on April 16, 1907.

FIELD FORCE.

A field force has been employed only in the inspection of the railways being constructed by the Philippine Railway Company on the islands of Cebu, Panay, and Negros.

It was probably the original intention to have this field force consist of one inspecting engineer on each island where the work of construction was being carried on. No regular field force was employed however until the latter part of December, 1906. This force was gradually increased as available men were found.

By resolution of the Commission of February 25, 1907, there was contemplated "a system of rigid inspection by the supervising railway expert and his staff," of the work of construction on the first section (20 miles) of railway on Panay and the first section (20 miles) on Cebu.

The idea was to keep a check on the number of laborers, mechanics, foremen, etc., employed on each item of construction and also a check on the amount of material going into each bridge, culvert, building, etc.

The reports of such check and inspection were to be sent to this office for compilation and entry in the records, from which it was intended to evolve a table of costs of each piece of work, such as bridges, culverts, station buildings, water tanks, tool houses, roundhouses, etc., as per classifications prescribed by the Interstate Commerce Commission.

Labor reports have been received and compiled up to and including June 14, 1907, but as the work had gotten barely started, and as it was impossible to obtain the results desired without the employment of a much larger and more expensive force, the idea was abandoned.

Prior to and under the resolution of February 25 above referred to, the following staff was employed at different times, as shown:^a

On June 15, 1907, with the approval of the Governor-General, the detailed inspection and timekeeping was discontinued. This action was afterwards confirmed by resolution of the Commission on July 3, 1907.

^a A table showing personnel has been omitted and is on file in the Bureau of Insular Affairs, War Department.

The release of timekeepers and inspectors left one inspecting engineer and two stable boys as the force of the government on each of the islands of Panay and Cebu on June 30, 1907, and this force will be continued unless need arises for a change.

The appointment of the three inspecting engineers from the United States under resolutions of the Commission of February 26, 1907, was made by cable through the Bureau of Insular Affairs. These engineers are exempt from civil service requirements, but receive full pay from date of leaving their place of residence in the United States en route to Manila, and are reimbursed for their actual and necessary traveling expenses to and from Manila. This is in lieu of leave and other privileges provided for civil service employees.

Report in detail of the various transportation companies follows:

MANILA RAILROAD COMPANY.

This company is the successor of the Manila Railway Company (Limited), an English corporation whose original charter or concession was granted by the Spanish authorities of the Philippine Islands on January 21, 1887, and covered the line from Manila to Dagupan, a distance of 196 kilometers, which was first put into operation in 1892.

No further concessions were granted to this railway company until 1902, when the Philippine Commission by act No. 554 of December 8, 1902, amended by act No. 704 of March 27, 1903, and confirmed by act No. 1510 of July 7, 1906, conferred on the Manila Railway Company (Limited) the right to construct a branch railroad from Guluginto to Cabanatuan, a distance of 91 kilometers, which was put into operation for its total length on December 18, 1905.

Acts No. 555 of December 8, 1902, amended by act No. 705 of March 27, 1903, and act No. 879 of September 9, 1903, granted the same railway company the right to construct branches from its main line in the town of Mabalacat, Province of Pampanga, to Camp Stotsenberg, a distance of 7.2 kilometers; this line was put into operation on May 15, 1903.

The same acts authorized the construction of a line 1.6 kilometers in length, from a point on the main line in the town of Bayambang to Camp Gregg. This line was never constructed, as it was considered unnecessary by the military authorities.

A concession for the construction of a line from Manila to Antipolo, a distance of approximately 32 kilometers, was granted by act No. 703 of the Philippine Commission on March 27, 1903, and confirmed by act No. 1510, July 7, 1906. This line was put in operation to Taytay, a distance of 23 kilometers, on April 28, 1906, and the work of completing it to Antipolo is still in progress.

Under the provisions of secs. 4 and 5 of the act of Congress approved February 6, 1905, known as the Cooper act, proposals for concessionary grants to construct, equip, maintain, and operate certain lines of railroad in the Philippine Islands were invited, and after long negotiations carried on by the honorable the Secretary of War, on the part of the Philippine government, and the parties interested, a concession was granted to Speyer & Co., of New York and London, for the construction of approximately 675 kilometers of railroad on the island of Luzon.

On July 3, 1906, Speyer & Co. assigned the concession to the Manila Railroad Company, a corporation of the State of New Jersey, the articles of incorporation being filed on June 6, 1906.

In conformity with the award of the honorable the Secretary of War, the Philippine Commission by act No. 1510 on July 7, 1906, granted to the Manila Railroad Company the right to construct, equip, maintain, and operate in perpetuity the following lines of railroad:

"A concession for the existing lines of the Manila Railway Company (Limited), and branches therefrom, as follows: From Manila, or from a point on the Manila-Antipolo line to Cavite and Naic, 29 miles (46.7 kilometers); from San Fernando to Florida Blanca, 14 miles (22.5 kilometers); from Dau to San Pedro Magalang, 9 miles (14.5 kilometers); from San Miguel to La Paz, 10 miles (16.09 kilometers); from Panique to Tayug, 28 miles (45.06 kilometers), and to complete, maintain, and operate the branches of the Manila-Dagupan line, now in course of construction, to Antipolo and Cabanatuan.

"A concession for a branch from the Manila-Antipolo line, now under construction, to continue the line, now authorized to Mariquina, from Mariquina to Montalban, an estimated distance of 8 miles (12.9 kilometers).

"A concession for a line from Manila, or from a point on the Manila-Antipolo line, to Batangas and Bauan, an estimated distance of 73 miles (117.4 kilometers), and for a branch therefrom from Calamba to Santa Cruz, an estimated distance of 22 miles (35.4 kilometers), with the right to extend such branch for a farther distance of about 5 miles (8.04 kilometers) for the purpose of extending the line to or building via Magdalena and Pagsanjan, and for a branch from Santo Tomas to Lucena, an estimated distance of 39 miles (62.76 kilometers), with the right to extend the same from Lucena, a farther distance of about 8 miles (12.9 kilometers), to a point on the coast at which the government may decide to construct a harbor.

"A concession for a line from Pasacao to Legaspi, an estimated distance of 72 miles (115.8 kilometers), and for branches from such line from Pill to Lagonoy, an estimated distance of 31 miles (49.9 kilometers), and from Ligao to Tabaco, an estimated distance of 21 miles (33.8 kilometers).

"A concession for a line from a point near Dagupan to Camp No. 1, in the direction of Baguio, an estimated distance of 25 miles (40.23 kilometers).

"A concession for a line northward from Dagupan to San Fernando, an estimated distance of 35 miles (56.33 kilometers)."

Subsection 15, of section 1, of act No. 1510, provides that:

"In consideration of this concession, and the waiver by the Philippine government of all claims against said Manila Railway Company (Limited), based on the Spanish concession, the said Manila Railway Company (Limited) shall fully release all claims against the United States, the government of the Philippine Islands, and the provinces and municipalities thereof, based on the terms of the concession granted by the Spanish Government to the Manila Railway Company (Limited); and also all claims growing out of the use and occupation of the lines of said Manila Railway Company (Limited) by the military authorities of the United States, and out of the damage to said lines, accessories, and equipment resulting during such use and actual occupancy, and especially the claim against the United States for \$1,515,000 gold, presented by the British ambassador to the Department of State of the United States on behalf of the said Manila Railway Company (Limited); and this concession shall not take effect as to the lines of the Manila Railway Company (Limited), including the branches thereof to Antipolo and Cabanatuan, until the grantee shall have presented to the Secretary of War a release and waiver of the claims aforesaid in form acceptable to the Secretary of War, duly executed by the proper officers of the Manila Railway Company (Limited), thereunto lawfully authorized by said company, and upon such release and waiver being given in a form binding on all holders of lien under any mortgage, deed of trust, or other instrument heretofore executed by said Manila Railway Company (Limited), the Spanish concession above referred to shall be deemed to be canceled."

The "waiver" required under the provisions of the above section was duly submitted by the Manila Railway Company (Limited), and approved and accepted by the honorable the Secretary of War on April 24, 1907, so that the property of the Manila Railway Company (Limited) came into the possession of the Manila Railroad Company as of said date, and the Spanish concession canceled.

On June 30, 1907, approximately 340 kilometers of the line had been finally located and approved by the Governor-General, and construction work had progressed as follows:

	Kilometers.
Dagupan-San Fernando (Union) line:	
Grading completed for.....	12.5
Rails laid for.....	10.5
San Fabian-Camp One line. Grading completed for.....	10.5
Dao-San Pedro Magalang line:	
Grading completed for.....	9
Rails laid for.....	4.5
San Fernando-Florida Blanca line:	
Grading all completed.....	24.52
Rails laid for.....	8
Mariguina-Montalban line. All construction work completed and line put in operation April 17, 1907.	
Paco (Manila-) Batangas line, grading completed for.....	38

Belt line (Manila) :	Kilometers.
Grading completed for.....	6
Rails laid for.....	.4
Cavite short line, from Paco (Manila) to Cavite. Grading completed for.....	15

Satisfactory progress is being made on the remainder of the surveys, and there is no doubt of the completion of the lines within the time provided in the act.

Statistics in regard to the operation of this railroad, with equipment used and length of line operated in 1905 and 1906, are as follows:

Length of line, territory covered.	Main line.	Sidings.	Main line.	Sidings.
Main line, Manila to Dagupan.....kilometers	196	-----	196	-----
Cabanatuan branch, Bigaa to Cabanatuan, kilometers	91	-----	91	-----
Antipolo branch, Manila to Taytay.....kilometers	16	Not given.	29	Not given.
Mariquina branch, Mariquina to Montalban, kilometers	-----	-----	-----	-----
Stotsenberg branch to Camp Stotsenberg, kilometers	7	-----	7	-----
Total.....	310	-----	323	-----

The increase in length of line during the year was: Antipolo branch, Manila to Taytay, 13 kilometers; Mariquina branch, Mariquina to Montalban, 13 kilometers.

The average length of line during the year 1906 was 320 kilometers.

TOTAL REVENUE FROM TRANSPORTATION AND OPERATION OTHER THAN TRANSPORTATION.^a

	1905.	1906.
Freight revenue.....	P 783,840.69	P 747,713.75
Passenger revenue.....	1,012,347.08	1,132,755.14
Mail revenue.....	1,834.45	4,513.48
Government transportation.....	79,882.53	121,293.56
Switching revenue.....	25,146.74	23,999.22
Storage of freight.....	409.79	49.14
Rent of buildings and property.....	12,664.77	7,750.76
Total.....	1,916,126.05	2,038,075.05

In addition, the revenue from station and train privileges was P707.77 during the year 1906.

TOTAL OPERATING EXPENSES.

[Statistics for 1905 not complete.]

	1906.
Administration.....	P 59,196.31
Transportation.....	210,125.99
Telegraph.....	16,210.91
Maintenance of equipment.....	296,360.61
Maintenance of way and structures.....	253,685.93
Registration of lands and internal revenue.....	16,625.42
Miscellaneous.....	19,018.62
Operating expenses Stotsenberg and Port line.....	26,004.96
Total.....	897,228.75

The operating expenses of the main line during the year 1905 were P631,810.35.

Total operating revenue.....	P 2,038,075.05
Total operating expenses.....	897,228.75
Net operating revenue.....	1,140,846.30

Percentage of operating expenses to operating revenue, 44 per cent.

^a Tables showing revenues and expenses in detail have been omitted, and are on file in the Bureau of Insular Affairs, War Department.

TAXES.

Main line.....	1906.
Cabanatuan branch.....	₱6,791.94
Antipolo branch.....	4,401.37
Marikina branch.....	
Stotsenberg branch.....	1,712.16
Total.....	12,905.47
Net operating revenue.....	₱1,140,846.30
Less taxes.....	12,905.47
Operating income.....	1,127,940.83
Gross operating revenue per kilometer of road.....	₱6,369.00
Operating expenses per kilometer of road.....	2,804.00
Net operating revenue per kilometer of road.....	3,565.00

Rail was relaid on 11.3 kilometers of the main track, 29½-kilogram rail replacing 21-kilogram rail, and about the same length of track was rebalasted.

The temporary pile bridge over the Peñaranda River was replaced by ten 30.5-meter spans of steel-lattice bridge.

The equipment on this line consists of 17 passenger engines, 18 freight engines, 19 first and second class cars, 10 second-class cars, 60 third-class cars, 1 inspection car, 717 freight cars, and 45 miscellaneous cars.

During the year the Antipolo line was opened for traffic to Taytay.

The following general information is added:

Revenues.	1905.	1906.
Passenger revenue, per train kilometer.....	₱2.2108	₱2.0622
Freight revenue, per train kilometer.....	2.80547	2.7318
Average amount received for carrying passenger 1 kilometer.....	.0206	.0200
Average amount received from each passenger.....	.6182	.62871
Passenger revenue, including mail and miscellaneous, per kilometer of road.....		3,570
Freight revenue, including switching, storage, and miscellaneous, per kilometer of road.....		2,790
Average amount received for each metric ton of freight.....	2.70424	2.48378
Gross earnings from operation, per train kilometer.....	2.45737	2.23101
Operating expenses, per train kilometer.....	.97539	.91453

AVERAGE HAUL.

Passengers.....kilometers..	29.86	30.06
One metric ton freight.....do..	88.08	81.65
Passengers hauled 1 kilometer.....number..	43,509,359	41,119,565
Metric tons freight carried 1 kilometer.....tons..	21,688,276	19,842,832

Accidents during the year were: 31 Class A, serious; 18 Class B, not serious; 44 Class C, minor.

The reduction of earnings during the year 1906 as compared with the previous year on the main line was on account of shortage of crops.

The earnings during the first half of the year 1907 indicate that this year will give better results on all lines than either 1905 or 1906.

MANILA ELECTRIC RAILROAD AND LIGHT COMPANY AND MANILA SUBURBAN RAILWAYS COMPANY.

Act No. 484 of the Philippine Commission, enacted October 20, 1902, empowered the municipal board of the city of Manila to grant a franchise for the construction, maintenance, and operation in the streets of Manila and its suburbs of an electric street railway and an electric light, heat, and power system.

Under the above authority the municipal board received bids, and by resolution on March 7, 1903, awarded the franchise to Mr. Chas. M. Swift, which was approved by the Philippine Commission on March 9, 1903.

The franchise was granted Mr. Swift on March 24, 1903, by ordinance No. 44 of the municipal board, and on March 27, 1903, he assigned the same to the

Manila Railway and Light Company, a corporation organized under the laws of the State of New Jersey. On July 6, 1903, the name of this company was, by due process of law, changed to the Manila Electric Railroad and Light Company, and the corporation is now so known.

This company was authorized on April 11, 1904, by act No. 1112 of the Philippine Commission, to acquire the properties of the existing street-car lines, then known as the Compañía de los Tranvías de Filipinas, which were constructed under grants of the general government of the Philippine Archipelago to Señor Don Jacobo Zobel and Señor Don Lucio M. Bregon on April 22, 1881, and October 22, 1884. Act No. 1112 also provided, in section 10 thereof, that the Manila Electric Railroad and Light Company should file its acceptance of the terms of act No. 1112, and surrender the franchises, including amendments thereto, of the Compañía de los Tranvías de Filipinas.

Said acceptance and surrender were filed on April 14, 1904, and November 4, 1904, respectively, and the municipal board on December 27, 1904, in accordance with directions to it contained in act No. 1112, enacted ordinance No. 70, amendatory of ordinance No. 44.

The Manila Electric Railroad and Light Company also operates the Manila Suburban Railways Company's lines, and both companies are officered by the same persons—otherwise they are separate entities.

On January 30, 1906, by act No. 1446, amended by act No. 1589, of February 1, 1907, the Philippine Commission granted to Charles M. Swift a franchise covering the construction, maintenance, and operation of an electric railway and of an electric heat, light, and power system from Paco (Manila) to Pasig, in the Province of Rizal, a distance of 9.8 kilometers.

In accordance with act No. 1446, of January 30, 1906, this franchise was assigned by Mr. Swift, on July 20, 1906, to the Manila Suburban Railways Company, a corporation of the State of Connecticut, incorporated July 5, 1906.

In act No. 1589 of the Philippine Commission, of February 1, 1907, the time for completion of the line to Pasig was extended from July 30, 1907, to January 30, 1908, and the railways company was, among other things, granted a franchise for an electric line from a point on its present line near San Pedro Macati to the town of Taguig and the Laguna de Bay, a distance of 9.65 kilometers.

That portion of the line from Paco to Pasig between the former point and Fort McKinley was opened for operation on April 18, 1907, and the construction of the remainder of the line to Pasig is well under way and will be completed within the time required by the act. Surveys only have been made for the line to Taguig and the Laguna de Bay.

The operations of the Manila Electric Railroad and Light Company for the past fiscal year follows:

MANILA ELECTRIC RAILROAD AND LIGHT COMPANY, YEAR ENDED JUNE 30, 1907.

Length of line.....	45.4 kilometers
(a) Length of double track.....	12.7 kilometers
(b) Length of single track.....	32.8 kilometers
(c) Length of sidings.....	5.95 kilometers
Revenue from transportation.....	₱967, 712. 58
Revenue from operation other than transportation.....	45, 031. 10
Total operating revenue.....	1, 012, 743. 68
Operating expenses:	
(a) Maintenance of way and structures.....	₱32, 896. 26
(b) Maintenance of equipment.....	71, 506. 87
(c) Traffic expenses.....	
(d) Transportation expenses.....	315, 729. 94
(e) General expenses and taxes.....	109, 193. 28
Total operating expenses and taxes.....	529, 326. 35
Net operating revenue.....	483, 417. 33
Per cent of operating expenses (including taxes) to operating revenue.....	52 per cent
Betterments—new sidings constructed past year:	
(a) One on Santa Ana line.....	76. 2 meters
(b) One on Malabon line.....	108. 66 meters

The following general information:

(a) Total number of passengers carried.....	10, 259, 297
(b) Average earnings per passenger.....	P0. 098
(c) Average expense per passenger.....	P0. 051
(d) Equipment consists of 111 motor cars, 1 freight car, and 1 wrecking car.	

MANILA SUBURBAN RAILWAYS COMPANY.

No report of the operation of the Manila Suburban Railways Company has been received for the last two months of the year ended June 30, 1907, during which about 8½ kilometers of this line were in operation.

DAET AND MERCEDES TRAMWAY.

This tramway was constructed under authority of act No. 1111 of April 8, 1904, which granted to Charles W. Carson the right to construct a 0.91-meter gauge tramway 7.24 kilometers in length from Daet to Mercedes, its port in Ambos Camarines. The line was put into operation February 1, 1905, animal power being used.

Freight handled during the year ended June 30, 1907, was: 13,832 packages merchandise; 42,735 sacks rice; 18,243 bales hemp; 4,136 bales loose hemp; 5,394 demi-johns vino; 57 cars firewood; 31 cars stone.

Total freight hauled.....	5, 066 metric tons
Total gross revenue.....	P23, 092. 33

TARLAC RAILWAY COMPANY.

Act No. 1448 of February 1, 1906, granted to Walter E. Olsen a franchise for the construction of a railway from Paniquil, on the line of the Manila Railroad, westwardly to Camiling, a distance of about 20 kilometers. - On June 13, 1906, the franchise was transferred by him to the Tarlac Railway Company, a corporation of the Philippine Islands.

This line, under the franchise, should have been completed April 4, 1907, but owing to scarcity of labor and materials the time for completion was extended by the Commission to June 4, and later to August 4, 1907.

On June 30 the line was practically 90 per cent done. When put in operation it will serve a productive rice country and become an important feeder to the Manila Railroad. Gauge of track built is 1.07 meters.

PHILIPPINE RAILWAY COMPANY.

Act No. 1497, enacted May 28, 1906, granted authority to the Philippine Railway Company, a corporation organized under the laws of the State of Connecticut, to locate, construct, furnish, maintain, and operate, under government guaranty of interest on bonds to be issued, the following lines of railway:

"On the island of Panay.—A line from Iloilo, in the province of Iloilo and island of Panay, in a northerly direction, forking to the town of Capiz and to a terminal on the Bay of Capiz and to the town of Bataan, on the north coast of the island of Panay, in the province of Capiz, a distance, approximately, of 100 miles (160.9 kilometers).

"On the island of Negros.—A line in the island of Negros, from the harbor of Escalante, on the northeast coast of said island westerly, following the coast line to Himamallan, a distance, approximately, of 100 miles (160.9 kilometers).

"On the island of Cebu.—A line in the island of Cebu, running north from the city of Cebu to Danao, on the east coast, and south from Cebu to Argao, on the east coast, with the option to the grantee of a line across the island from Carcar or Sibonga to the west coast, and thence along the coast between Dumanjug and Barill, a distance approximately of 95 miles (152.8 kilometers)."

This grant was made in accordance with the provisions of sections 4 and 5 of the act of Congress approved February 6, 1905, under the conditions of which proposals had been received of William Salomon & Co., Cornelius Vanderbilt, J. G. White & Co. (Incorporated), and Charles M. Swift, with whom were associated the International Banking Corporation, H. R. Wilson and Heidelberg, Ickelheimer & Co., for the concession and authority to construct, equip, maintain, and operate lines of railroad in the Philippine Islands, as set forth above.

The following tabulation shows insular appropriations for the construction of fourteen important roads, aggregating a total length of 510 kilometers, during the year cited, and exclusive of appropriations for the Benguet road:

Fiscal year.	Congressional relief fund.	Insular funds or improvement bonds.	Total.
1904.....	₱1,335,600		₱1,335,600
1905.....	99,700	₱87,000	186,700
1906.....	60,000	84,600	144,600
1907.....		130,000	130,000
Total.....	1,495,300	301,600	1,796,900

The following tabulation shows provincial expenditures (exclusive of municipalities) for roads and bridges, compiled from the annual reports of the auditor for the years cited, except for the year 1907, which is subject to correction. For comparative purposes the amounts shown in the auditor's reports for the fiscal years 1902, 1903, 1904, and 1905 have been reduced to Philippine currency at the arbitrary rate of Pfs. 1=\$0.50=₱1.00.

Fiscal year.	Total.	Congressional relief fund.	Difference.
1902.....	₱199,995.90		₱199,995.90
1903.....	465,376.23		465,376.23
1904.....	1,228,847.95	₱619,314.27	609,533.74
1905.....	895,067.11	289,145.91	605,145.91
1906.....	700,018.52	222,788.96	477,229.56

These funds have not been expended on the improvement and maintenance of roads in accordance with a comprehensive study of a road system, but too frequently to meet the immediate needs of a community, resulting in the necessity of a similar expenditure the succeeding season.

An analysis of the amounts clearly indicates that a possible and reasonable increase in both insular and local expenditures under systematic supervision can attain, within a few years, to a system of practical and durable roads throughout the islands.

INSULAR ROADS.

The appropriations heretofore mentioned by the insular government have been made mainly for the construction of 14 important new roads. Practically none of these roads are satisfactorily completed, and there remain to be constructed before they can be turned over in equity to the province to maintain: First, many permanent bridges to replace temporary timber structures which were erected from the most available timber in order to make these roads passable at the earliest possible date; second, the surfacing of portions of these roads in order to attain to a first-class roadbed passable throughout the rainy season.

The total expenditure thereon during the fiscal year was ₱128,657.70, mainly on the Cebu-Toledo road, the Pagbilao-Atimonan, the Bay-Tiaong, and the Wright-Taft roads. The district engineers of the provinces in which these roads are located have had charge of the construction work. The insular government probably will be required to provide the larger portion of the maintenance expenses of a few of these roads located in the poorer provinces.*

* Money statements showing the financial condition of all of these roads on which expenditures have been made during the past year, and a table showing the principal data in connection with the most important of these roads, additional work required, and the estimated amount necessary to complete satisfactorily these roads before turning them over to the provinces for maintenance have been omitted and are on file in the Bureau of Insular Affairs, War Department.

SAN MIGUEL DE MAYUMO-SIBUL SPRINGS ROAD, BULACAN.

A survey was authorized by the Governor-General under date of June 5, 1906, in order that provision might be made for the reconstruction of a road that had formerly existed between San Miguel de Mayumo, a barrio on the Cabanatuan branch of the Manila Railway Company, and Sibul Springs, making accessible the springs at Sibul, noted for their medicinal value during Spanish days.

Mr. R. B. Tufts, assistant engineer, was detailed to this work on July 15, 1906. A reconnaissance was made of the two most feasible routes. The survey was completed on August 1, at an approximate cost of ₱450. He estimated that approximately ₱41,000 would cover the cost of constructing the road and necessary structures.

Under date March 15, 1907, the Philippine Commission authorized the director of public works to advertise for a period of twenty days for proposals for the construction of the San Miguel de Mayumo-Sibul Springs road, in accordance with the plans and specifications which had been prepared and submitted. On March 22 bids were advertised for and opened on April 10 in the presence of the competitive bidders.

This method of constructing roads by contract under rigid specifications marks a radical departure from previous methods, and the local contractors manifest considerable interest therein.

In accordance with a resolution of the Commission, dated April 24, the secretary of commerce and police awarded the contract to C. W. Mead & Co. for the sum of ₱38,875. The contract was executed May 2. Mr. Max Dobblins, assistant engineer, was designated as engineer in charge of the construction of the proposed road and established headquarters at San Miguel on May 14, on which date preliminary work was started by the contractor. Active work on grading was commenced May 27, and the work has progressed favorably since that date, with but few interruptions on account of rain.

The contract called for the suspension of work from June 1 to September 30. The contractor, however, requested permission to continue with the construction of the road at his own risk, and under the condition that he pay the cost of superintendence he was permitted to proceed with same.

In the barrio of Kambias it was found that 30 nipa houses were located on the 20-meter right of way. The necessity of moving them, in order that a suitable street might be established, was pointed out to the people, and the matter was amicably settled and the encroaching houses were removed without serious delays.

The contractor has had an average force of—

40 laborers at.....	₱0.50 per day.
3 capatazes at.....	1.50 per day.
3 drivers at.....	.60 per day and subsistence.
3 Americans at.....	175.00 per month and subsistence.

Estimate of work accomplished:

Clearing and grubbing 0.6 hectares.....	₱100.00
Embankment, 2,050 cubic meters.....	1,435.00
Gravel surfacing, 60 cubic meters.....	403.00
Total.....	1,838.00

Tabulation C submitted herewith shows the engineer's estimates of quantities, the lump-sum bids, and the supplementary unit-price bids for use in possible modifications of quantities.^a

BENGUET ROAD AND BENGUET IMPROVEMENTS.

The superintendence of the Benguet road was under the immediate control of the provincial governor of Benguet, Mr. W. F. Pack, up to December 15, 1906. Mr. R. K. West, assistant engineer, was then appointed acting superintendent, and has had immediate charge of the work throughout the remainder of the fiscal year.

The traffic over this road during the past season has been unprecedented, owing to the passenger traffic, the transportation of mining and milling machinery, the building of residences at Bagulo, and the development of Camp John Hay by the military.

^a Omitted and filed in the Bureau of Insular Affairs, War Department.

During the rainy season of 1906 the road was closed for short intervals of only a few hours' duration. However, the upper unsurfaced portion of the road through the clay slopes from Camp 7 to Bagulo was almost impassable on account of the deep mud. A soft roadbed also impeded traffic on the lower portion of the road where it had not been surfaced. The work of surfacing the upper part of the road was begun in October, 1906. There have been surfaced with gravel 685 linear meters, and with broken stone 2,651. On the lower portion of the road there have been placed 2,916 cubic meters of gravel. Of parapet walls 2,316 linear meters have been built, of which 792 have a section of 0.232 square meters and 5,524 a section of 0.209 square meters. These parapet walls have prevented some possibly serious accidents and also afford a sense of security to the travelling public.

Nine bridges aggregating a length of 95 meters have been rebuilt, on which were used 18,385 feet B. M. of new and 10,400 feet B. M. of old lumber. Seventeen small bridges or box culverts below the Bagulo boundary line have been repaired, and this portion of the road may be, in equity, turned over to the province of Pangasinan for future maintenance. Six short-span bridges have been replaced by reinforced concrete slab floors. The timber floors of the small masonry structures are also being replaced by concrete slabs as rapidly as extensive repairs are needed. Five half bridges have been replaced by rubble masonry walls, and it is desired to replace the remaining 14 half bridges in the same manner during the coming year.

On the suspension bridges all head blocks were renewed. Various minor repairs have been made to the floor system, towers, and hangers. The cables are in a fair condition. All timber work in these bridges will need renewal in the near future, unless the bridges are replaced with permanent structures.

The caminero system was started in October, over 27 kilometers of road, with 2 laborers assigned to each 1.6 kilometers or section. Houses were built for the camineros and their families, and steadier and more efficient labor has been the result. This system was extended to the portion of the road above Camp Four, but with only one man to a section of 0.8 kilometer. When the road is completely surfaced and in good condition, the caminero system will show greater efficiency and economy in the maintenance of this road.

The bullocks remaining on hand the previous year were turned over to the bureau of agriculture, as they were no longer useful as a means of transportation. In lieu of these bullocks 6 mules and 4 Chinese ponies were purchased and better transportation facilities secured.

A 4-ton road roller was shipped to the road in April, and used in connection with the surfacing on both the lower and upper ends of the road.

Surveys were commenced in February for the purpose of securing data on which to base designs and estimates of the cost of replacing the temporary suspension bridges and several smaller bridges with steel structures. These surveys were completed in May, and the necessary designs, plans, estimates, and specifications are now in progress. The work has been advanced sufficiently to show that 9 large bridges aggregating a total length of 547.3 meters, the largest span of which is 79.24 meters, and 7 smaller bridges aggregating a total length of 144.78 meters will be required at the earliest practicable date and that 24 small bridges aggregating a total length of 396 meters should be replaced with permanent steel or reinforced concrete structures within a couple of years, making a total of 40 proposed permanent bridges which should be replaced with steel or reinforced concrete structures on account of the anticipated failure of the present temporary ones. The loading, on which designs for the above proposed bridges have been based, is equivalent to 2 tandem 40-ton electric cars; the general type of bridge is a deck truss, or a plate girder; the floor systems are uniform as fully as is practicable and the use of ipil flooring is proposed.

The expenditures during the fiscal year on the maintenance of the Benguet road amounted to ₱93,732.57, of which ₱84,916.55 were from funds appropriated to this bureau and ₱8,816.02 from Benguet improvements, general fund, accruing from sales of property and supplies. Of this amount, ₱4,562.56 were paid on account of bills incurred during the fiscal years 1904, 1905, and 1906.

Benguet improvements were under the immediate supervision of Mr. G. H. Guerdum, assistant engineer, from July 1, 1906, to February 28, 1907, and under Mr. Wm. M. Haube, assistant engineer, for the remainder of the year. The duties pertaining to this office are numerous, consisting of topographical, road, and town-lot surveys, the setting of grade stakes for road construction, location of roads and trails within the province upon the request of the provincial governor, inspection of construction of government buildings, the cus-

todianship of all government buildings, and the execution of repairs required on same.

The principal items of work accomplished were: A survey for the purpose of increasing the Bagulo town-site reservation to include certain lands in or near the barrio of Pakdal which were suitable for building sites. This was completed and the plan forwarded in August, 1906. In order that water suitable for drinking purposes might be available for the guests at the hotel and the residents at Bagulo, a location, survey, and temporary construction of a new road to the "big spring" was completed, to enable the use of the spring during the summer season; permanent construction will follow at the close of the rainy season. A location and survey of a road approximately 1,372 meters in length known as the "Mirador road," on the property of the Jesuit mission, was made in April, the estimated cost of which was about ₱7,000 and, pending definite decision by the order of Jesuits regarding the construction of same, the existing trail was widened, so as to allow transportation to reach the site of the cottages. Preliminary lot surveys in Bagulo town-site have been carried on under instructions given by the consulting architect, and when approved are turned over to the bureau of lands for final surveys and the necessary action as to the disposition of the lots. Road surveys within the Bagulo town-site reservation have also been carried on under instructions from the consulting architect. During the year approximately 19 kilometers of proposed roads have been located, of which about 15 kilometers have been subdivided into residence lots. Investigations, surveys, reports, and estimates have been made on proposed artificial lake, water-supply system for the residence of the Governor-General, water-supply system for government buildings, athletic field, temporary native town-site, excavation for proposed civil hospital, excavation for proposed municipal market, constabulary school-building site, and the government agricultural and stock-farm buildings.

A location was made upon the request of the governor of Benguet, with a view of connecting the new and old portions of the Benguet road near Laoacan, Benguet, in the endeavor to utilize the stretch of 6.4 kilometers of well-constructed old Benguet road, between Laoacan and Bagulo. This proposed road or trail has a maximum grade of 5 per cent. The relocation and survey of the Bagulo-Suyoc trail, 11.27 kilometers in length, and a relocation of a 1.6-kilometer section of the Bagulo-San Fernando trail, was also completed. A survey, along the Agno ridge about 29 kilometers north of Bagulo, locating a trail about 16 kilometers in length and having a maximum grade of 6 per cent, was completed. This trail forms an important part of the route between Bagulo and Cervantes.

During the year approximately 9,470 meters of roads have been opened up for traffic. The general policy followed in the construction of roads from the town-site funds has been to build those roads which were most important in providing communication through certain residential sections in which lots had been sold and the construction of residences is pending or in progress, and in decreasing the distance to parts of the reservation to which there was considerable traffic. The most of these roads are suitable only for the dry-season traffic. They will require additional expenditures for surfacing and for the construction of permanent bridges and culverts.

During the coming year it is contemplated surfacing approximately 6 kilometers of road between those points carrying the heaviest traffic, and rendering accessible all parts of the town site throughout the year. The estimated cost of the proposed surfacing, using local stone, is approximately ₱2,500 per kilometer for a surfaced section 3.65 meters wide.

Inspection of the construction of the residence for the Governor-General has also been carried on by this office, very little progress being made on this work up to the latter part of June, owing to inability to find suitable sand and lime. This difficulty has been overcome, and construction work was progressing satisfactorily at the close of the year.

Funds accruing from the sale of reservation lots are in general available for executing the improvements above enumerated, and ₱24,803.28 were expended on construction of roads during the fiscal year and on improvements of the town site.

DIVISION OF BUILDING CONSTRUCTION AND REPAIR.

The position of master builder was vacant from February 12, 1906, to January 11, 1907, on which date it was filled by the appointment of Mr. Walter S. Haldeman.

A considerable number of the government buildings are of the Spanish type of architecture, two stories in height, the lower stories of which are constructed of massive but inferior masonry, and the upper stories of high grades of native timber. Heavy tiling set in mortar is the usual type of roofing, although many galvanized-iron roofs have been constructed.

General repairs have been required, usually on account of the destructive effects of the white ants (anay), which ultimately attack the best grades of timber, and on account of the weathering of the masonry, the decay of timber especially at points of contact with masonry, and the deterioration of the roofing. The policy of this division has been to replace flooring whenever practicable with reinforced concrete or steel-concrete construction in order to ultimately attain to a fireproof or a slow-combustion structure. Galvanized iron has been used for the extensive repair of failing roofs. Considerable difficulty has been encountered in securing in the local markets a sufficient quantity of high-grade galvanizing. It is also desired to introduce the use of wire glass and metal sashes for skylights and similar work. The difficulties encountered in roof repairs demand the best of workmanship and material, especially on account of the coexistence of high winds and tropical rains.

The principal buildings extensively repaired during the past year were the Intendencia, the ayuntamiento, the internal-revenue building, the Malacañan palace, the Santa Lucia barracks, painting of the roofs of the government laboratory building, the conversion of some of the city shops into buildings suitable for the school of trades and arts, of the old captain of the ports building into a union ticket office, of the old port works building located on the north side of the Pasig River into a Chinese detention station, and of the Santa Lucia building formerly occupied by the bureau of port works into a building suitable for temporary use by the medical school.

Sixty-nine projects have been executed under maintenance, alteration, and repairs, provided for in the appropriation bill and authorized by the Governor-General, at a cost of ₱30,979.25.

Two hundred and two projects under miscellaneous repairs have been accomplished for the various governmental bureaus and offices under proper authorization and for which bills are rendered in accordance with accounting regulations approved by the auditor, at a cost of ₱36,767.97.

There have been executed 527 general repairs and emergency projects at a cost of ₱25,464.03.

A total of 798 projects have been executed at a cost of ₱93,211.25.

The following 9 buildings have been completed by contract, inspections furnished by this office:

Building.	Contractor.	Contract price.
Insane ward, San Lazaro.....	The B. W. Cadwallader Co.....	₱32,044.00
High school, Dumaguete.....	R. M. Gotaucó.....	26,850.00
High school and shop, Tagbilaran.....	do.....	28,000.00
High school, Surigao.....	do.....	27,000.00
Trade school, Surigao.....	do.....	9,400.00
Provincial building, Calapan.....	Paulsen, Foote & Silver.....	13,433.00
High school, Iloilo.....	R. M. Gotaucó.....	28,550.00
Intermediate school, Iloilo.....	W. M. Lambert.....	14,458.86
Trade school, Iloilo.....	R. M. Gotaucó.....	13,000.00
Total.....		193,136.86

The following 8 buildings have been started and are in course of construction:

Building.	Contractor.	Contract price.
Intermediate school, Iligan.....	M. S. José.....	₱13,987.99
High school, Bacolod.....	R. M. Gotaucó.....	30,850.00
Trade school, Bacolod.....	W. H. Lambert.....	15,991.17
Governor-General's residence, Baguio.....	O. F. Campbell.....	26,885.00
Trade school, Bacolor.....	Antonio Santos.....	12,000.00
High school, San Fernando, Pampanga.....	Tan Sameo.....	44,606.60
Provincial building, San Fernando, Pampanga.....	J. W. Gray.....	69,737.00
Constabulary barracks, Zamboanga.....	W. N. Olum.....	42,500.00
Total.....		256,007.76

Bids have been received and are under advisement for the construction of the following buildings:

Building.	Lowest bidder.	Bid.
High school, Capiz.....	W. H. Lambert.....	₱39,000.00
Provincial building, Albay.....	B. W. Cadwallader Co.....	73,000.00
Constabulary barracks, Albay.....	do.....	51,925.00
High school, Iba.....	R. M. Gotanco.....	26,800.00
Trade school, Catbalogan.....	R. E. Scott.....	21,000.00
High school, Orani.....	Tan Samco.....	12,486.00
Total		224,211.00

PROVINCIAL WORK.

The tabulation of work accomplished by the district engineers shows a total of 58.5 kilometers of road construction, 327.7 kilometers repaired, and 1,055.7 kilometers maintained. Of bridges and culverts of all classes 378 were constructed and 176 repaired; 11 buildings were constructed and 20 repaired.^a Twenty-six surveys were made at a cost of ₱14,444.76 and miscellaneous work executed at a cost of ₱66,420.97. The total expenditures under the district engineers aggregated ₱993,093.20, an increase of ₱138,000 over the preceding fiscal year. The total cost of superintendence of these expenditures was ₱83,438.00, of which bills to the amount of ₱31,071.25 were rendered in accordance with the provisions of act No. 1401. With few exceptions the culverts and bridges were constructed of permanent materials, such as masonry, reenforced concrete, steel-concrete, or steel. The largest reenforced concrete arches constructed have a span of 18.3 meters.

A brief resume of important works in each district follows:

District No. I.—Comprising the provinces of Cagayan and Isabela, Mr. R. A. Blair, district engineer up to April 1, 1907, Mr. Alex. Mackenzie, acting district engineer from April 1 to June 30, 1907. Five bridges are under construction between Tuguegarao and Cabagan, 3 bridges have been constructed, and various smaller road and bridge projects executed. The provincial government building is under construction, and a temporary trade school has been constructed at Tuguegarao. Repairs have been made to the constabulary building and to the provincial high school building at Ilagan. Plans have been prepared for the municipal market at Tuguegarao and for the municipal building at Amulung. Three surveys and an investigation on the Aparri River have been completed. The total expenditures under the supervision of the district engineer were ₱35,876.17.

District No. II.—Comprising the Provinces of Ilocos Norte, Ilocos Sur and La Union (transferred temporarily from District III), Mr. E. P. Shuman, district engineer. In Ilocos Norte 7 bridges have been constructed and 18 repaired. The provincial building has been repaired and several plans, reports, and surveys made. Under municipal work 16 buildings have been repaired or constructed. In Ilocos Sur 14 bridges have been constructed, 9 provincial buildings repaired or reconstructed, 27 bridges repaired, and 15.868 kilometers of road reconstructed or repaired. Under municipal work, 17 buildings were constructed or repaired; of these the provincial trade school at Vigan is being constructed of concrete. Considerable interest is being shown in Ilocos Sur in the extension of existing irrigation projects. Insular aid for these projects does not appear expedient, and it is not feasible to finance them under existing laws. The total expenditures under the supervision of the district engineer were ₱106,070.97.

District No. III.—Comprising the provinces of Pangasinan and La Union (temporarily transferred to District II), Mr. E. S. Wheeler, district engineer. A second story of the Binalonan presidencia was constructed. California redwood was used, except for the flooring, which was lambang. The Dagupan-Binalonan road repairs consisted of the construction of 42 reenforced concrete box culverts of spans varying from 1.2 meters to 3.65 meters, and one 8.5 meters reenforced beam bridge, 0.71 meters deep. The total aggregate spans of these bridges and culverts was 89 meters. No work was executed on the roadway except the construction of approaches to the above structures. On the Bayam-

^a These tables have been omitted and filed in the Bureau of Insular Affairs, War Department.

bang-Oaoa road two reenforced culverts were completed. The Dagupan-Mangaldan road was reconstructed into a macadam road for the first 0.8 kilometer and 1 steel I-beam bridge, span 9.144 meters was constructed on old Spanish abutments. Between San Jacinto and Manaong, two 18.29 meter reenforced arches were constructed, and one 5.48 meter reenforced concrete arch culvert on the road from Manaog to Binalonan, at the barrio of Coldona. One 9.144 meter I-beam bridge has been completed in the barrio of Suspiro, between Dagupan and Binmaley. One 12.2 meters reenforced beam bridge, 1.45 meters deep, has been constructed in Dagupan. The total expenditures under the supervision of the district engineer were ₱83,698.81.

District No. IV.—Comprising the provinces of Pampanga and Tarlac, Mr. S. V. Cortelyou, district engineer. In Pampanga 24 bridges of concrete, steel, or reenforced concrete have been constructed, and 2 bridges have been erected. Two important roads providing outlets to water transportation for fertile agricultural districts have been completed. Construction of short stretches of road, macadamizing of the roads on the provincial grounds, and minor road repairs throughout the province have been executed. A provincial stone quarry and rock crushing plant have been opened at Arayat. The preliminary location surveys were made of the sites on which the provincial building and the high school building at San Fernando are to be erected. In Tarlac the principle projects have been the construction of the Tarlac dike, which is treated of separately in this report. Aside from this the work has consisted of maintenance and repair to roads and bridges. The total expenditures under the supervision of the district engineer were ₱81,635.42.

District No. V.—Comprising the provinces of Bulacan and Nueva Ecija, Mr. R. C. Hardman, district engineer up to March 4, 1907. Mr. F. S. Chapman, district engineer from March 5, 1907, to June 30, 1907. In Bulacan 2 reenforced concrete bridges and 29 concrete culverts have been constructed. Two trestle bridges of 24.384 and 39.015 meter spans, respectively, are under erection. Extensive road repairs have been executed throughout the province, mainly by voluntary labor. In Nueva Ecija 2 reenforced concrete bridges have been constructed and 2 are under construction. Heavy road repairs to the extent of 1.6 kilometers have been made and other minor projects executed. All construction in this district has been of a permanent nature. The total expenditures under the supervision of the district engineer were ₱55,031.58.

District No. VI.—Comprising the provinces of Cavite, Laguna, Rizal, and Batangas (temporarily transferred from District VII), Mr. E. J. Westerhouse, district engineer. Throughout the entire district 119 reenforced concrete box culverts, with a total span of 138.38 meters, have been constructed. One 7-panel steel highway bridge and one combination concrete-steel and reenforced concrete bridge, having a total length of 27.5 meters, have been erected. Sixteen bridges have been repaired by putting in steel stringers or new foundations. Good macadam roads, 1.6 kilometers in length, were constructed from provincial funds, 94 kilometers of road were repaired in such a substantial manner as to admit of carromata traffic throughout the wet season, and 156.9 kilometers of improved roads in the district have been maintained either by contract or by the "caminero system." A market building at Pasig, Rizal, having concrete pillars, corrugated galvanized-iron roof, and cement floor was completed out of municipal funds, and the provincial jail at Santa Cruz, Laguna, was extensively repaired, modern sanitary methods sufficient to accommodate 500 prisoners and new sentry walks being provided. Additional fencing was erected and the grounds placed in an attractive condition. The Batangas provincial building, the Rizal industrial school building, the Rizal jail of concrete blocks, 1 warehouse in Laguna, and various repairs to other buildings, all of a substantial nature, have been completed during the year. The irrigation projects in this district, provided for from insular funds, will be treated separately in this report. The total expenditures under the supervision of the district engineer were ₱192,497.61.

District No. VII.—Comprising the provinces of Tayabas and Batangas (temporarily transferred to District VI), Mr. J. S. Nichol, district engineer. The Lucban-Banban trail, 32.186 kilometers in length and impassable, was repaired to such an extent that an American horse can traverse it the entire length. The road to the provincial corral, 0.402 kilometer in length, was completed. One 8.534-meter reenforced-beam bridge has been completed over the stream at Banban, and 1 6.096-meter reenforced-beam bridge at Bantaawayan Creek has been designed and is authorized. Street improvements in the municipality of Lucena, consisting of ditching, grading, and surfacing for 0.483 kilometer

and the construction of 2 concrete culverts, have been completed, and in addition 79.226 kilometers of road have been repaired and maintained, including the replacing of bridges and culverts of a temporary nature with structures of an approved type. The district engineer has had charge of the Pagbilao-Atimonan road and the Sariaya and Candelaria bridges, insular projects which have been heretofore described. The total expenditures under the supervision of the district engineer were ₱86,848.90.

District No. VIII.—Comprising the provinces of Ambos Camarines, Albay, and Sorsogon, Mr. H. C. Humphrey, district engineer. Approximately 209 kilometers of road have been repaired and maintained. Fifty-two bridges have been repaired and 2 have been constructed. Repairs to buildings, minor surveys, examinations, and reports have been executed. The district engineer has not had charge of the high school, constructed at Sorsogon at a cost of ₱16,560.47. In Albay Province the caminero system of road maintenance is in general use and in satisfactory condition. Ambos Camarines has expressed its intention of adopting the caminero system and has appropriated ₱40,000 toward highway repairs. The total expenditures under the supervision of the district engineer were ₱59,611.49.

District No. IX.—Comprising the provinces of Samar and Leyte, Mr. E. O. Worrick, district engineer. The principal work done has been the construction of the constabulary barracks at Catbalogan and the supervision of the construction of the Wright-Taft road, an insular project which has been heretofore described. Several smaller projects and investigations have been completed, including an estimate for the Dagamo-Burauen-La Paz trail and bridges. Contracts have been entered into for a bridge consisting of 3 steel trusses having spans of 18.3 meters each, and bridging the Palo River. The total expenditures under the supervision of the district engineer were ₱50,765.25.

District No. X.—Comprising the provinces of Iloilo, Negros Occidental, Antique, and Capiz, Mr. O. D. Filley, district engineer up to March 13, on which date he was relieved by Mr. R. F. Moss, district engineer. At Bacolod a reinforced concrete arch, 18.3 meters span and having a total length of 36.6 meters, was completed in April and christened the General Smith Bridge. Reinforced concrete arches have been constructed in Negros at Pahamacy, Cabalagnan, Guinalaran, Cabog, and Silay, and a flat-slab bridge, 6.7 meters span, at Banago. Reinforced concrete pipe culverts have been placed on the coast road from Bago to Silay. In Iloilo 6 reinforced concrete arches have been constructed on the Iloilo-San Joaquin coast road, one flat arch at Baluyan and a combination ipil-steel trestle, 25.908 meters in length, center span 15.24 meters, has been erected at Pototan. Eight other reinforced concrete bridges are under contract and plans have been prepared for 11 more. Many pipe culverts have been placed in the main highways. Repairs have been accomplished on the Mandurriao-San Miguel road, New Washington-Calivo road in Capiz, and upon the Bacolod-Silay, Bacolod-Bago, Bacolod-Murchia, and Silay-Saravia roads in Negros, heavy gravel being obtained from adjacent rivers. Of roads 34 kilometers have been repaired and 5.6 kilometers reconstructed. The municipalities have responded to the suggestions of the district engineers in commendable manner, San Carlos alone voting ₱6,000 for public works. At Bacolod the high school and trade school buildings have been constructed and concrete reconstruction of the provincial jail has been completed. A double-wall fireproof vault adjoining the provincial building was erected for the office of the provincial treasurer, and an addition to the Iloilo trade school is now under construction. The Iloilo "burnt district," one-half mile square, has been resurveyed by the district engineer. A new system of streets has been laid out, and the grading and paving of the new streets is in progress. The total expenditures under the supervision of the district engineer were ₱140,043.73.

District No. XI.—Comprising the provinces of Cebu, Negros Oriental, Bohol (Surigao and Misamis temporarily transferred from District XII), Mr. T. W. Allen, district engineer. The district engineer has supervision of the Cebu-Toledo road, an insular project previously described, and the maintenance of the Cebu-Minglanilla road. Plans have been prepared for a reinforced concrete bridge of three 12.2-meter spans at Dalaguette and for a number of Tribunales and municipal schools. Work in the "burnt area" of Cebu, involving the laying out of modern streets, arranging with the property owners for the transfer and allotment of lots, and the survey of lots has occupied considerable attention. This work when completed will result in an improvement of marked benefit to the city. The total expenditures under the supervision of the district engineer were ₱79,970.28.

District No. XII.—Comprising the provinces of Surigao and Misamis, was temporarily discontinued as a district March, 1907, and combined with District XI. Mr. B. H. Burrell, district engineer, was then transferred to the bureau of navigation. One bridge was completed over the Surigao River, and a pile driver and 2 ferry pontoons were constructed. Of coral road 1,219 meters were constructed in Surigao. Surveys have been made for a road map of northern Surigao for trails leading into the municipality of Surigao and for the Bogotabagalaon road. Surveys were also made of the Surigao high school grounds, and plans prepared for the Dapa tribunal, which was erected by the municipality. Other surveys were made of provincial property and estimates prepared for the Dinagat school building. The erection of the Surigao high school and shops was given superintendence and plans prepared for various proposed bridges. The total expenditures under the supervision of the district engineer were ₱16,042.99. Additional to the work accomplished under the immediate supervision of the district engineer, the provincial treasurers have expended ₱187,283.20 on public works, of which ₱40,054.02 were expended on the construction, repair, and maintenance of roads, ₱24,964.94 on the construction and repair of bridges and culverts, ₱80,310.61 on the construction and repair of buildings, ₱24,077.09 for equipments, and ₱10,614.06 for miscellaneous expenses.^a These amounts include the expenditures in the non-Christian provinces which are not subject to the provisions of act No. 1401. The treasurers have in some cases supervised work that properly came under the jurisdiction of the district engineer, in order to save the province the possible expenditure of 10 per cent for superintendence. They have with few exceptions prosecuted the work after consultation with the district engineers and in accordance with the plans and specifications, regardless of the provisions of the law which grant to them the power to execute all work costing less than ₱500. The district engineers have no jurisdiction over municipal works, except upon the request of the municipal councils. While in the past the municipalities have accomplished a minimum amount of public work, the needs of the municipalities have been pointed out by the district engineers and discussed repeatedly with the interested officials, who are now showing considerable activity in needed improvements, especially along the line of bridges, buildings, improved streets, and pure water supplies. No data is available at the present time on which a comprehensive tabulation of municipal works for the calendar year 1906 can be based.

IRRIGATION.

Considerable data on irrigation has been presented in previous reports. This subject, so important to the agricultural interests and to the development of the islands, has received slight attention during the past year. No legislation relative thereto has been enacted. No technical forces have been available for topographical surveys and for the collection of data relative to watersheds, stream measurements, precipitation, duty of water, and local laws and customs, all of which are so necessary in the creation of irrigation districts and the establishment of a comprehensive, effective irrigation system for these islands.

It is believed under present conditions to be desirable and practicable to attain to an irrigation institution for the islands which will secure government control of all water, and which will include supervision of all works of construction, except distributing ditches and of the allotment of water within each district. The expenses to be incurred should be secured preferably by the sale of bonds and refundable by the property interests served within a reasonable period. Such refunds should be available upon receipt for new projects, and the maintenance of works constructed should be provided for by some system of taxation against the land served and accomplished under government regulations.

Repairs under the direction of the district engineers have been executed upon the request of the director of lands on the irrigation works of the "Friar lands" purchased by the government and located in the provinces of Cavite, Laguna, and Bulacan. Insular funds to the amount of ₱25,000 were appropriated for these works, ₱20,274.96 of which were expended under the direction of Mr. E. J. Westerhouse, district engineer. The work accomplished consisted of the following:

^a A table showing the expenditures by provincial treasurers has been omitted and filed in the Bureau of Insular Affairs, War Department.

In some of the tunnels the original adobe stone lining failed and the unlined crowns collapsed and restricted wholly or in part the flow of water. Several thousand cubic meters of this caved-in material were removed and the falling sections repaired with arched concrete linings in the Bancud, Balayangan, and Molino tunnels. The Balayangan Dam was repaired with a layer of concrete averaging 0.2 meters in thickness, 5.5 in width, and 33 in length. Light repairs to the Molino Dam were made, and a concrete retaining wall 29 meters in length was extended out from the end of the wing of the Julian Dam to prevent overflow and destructive erosion by flood water.

The San Juan Dam is located in a gorge of adobe stone. A wide, deep channel had been cut by overflowing water at the toe of the dam, undermining the masonry. This was repaired by the construction of a concave reenforced concrete slab, supported by reenforced concrete beams and protected at the toe by a 0.3 meter concrete wall, extending to the ledge rock.

The Marcelo Dam is similarly located, and it was originally constructed over a pocket of about 100 cubic meters of stone, which was covered with rubble masonry laid in lime mortar. The mortar disintegrated and the filling gradually scoured out to within 2 meters of the face of the dam. A concave reenforced concrete slab was constructed spanning the entire opening, supported by a reenforced concrete beam and at the toes of the dam by a concrete wall.

The repairs to the Marilao Dam, Lolomboy estate, province of Bulacan, cost ₱1,239.23, which were expended under the immediate supervision of Mr. F. S. Chapman, district engineer. The work accomplished consisted of putting in new concrete footings under 15 meters of the toe of the adobe stone dam, making similar repairs to 15 meters of wing wall and relaying a portion of the same, the reconstruction of 23 meters of embankment and wall which had fallen, and the pointing up of the face of the dam. General repairs were also made to the retaining wall at entrance of tunnel, to the tunnel, and to 53 meters of the viaduct.

The total amount expended by this bureau in the repair of irrigation works on Friar land estates was ₱21,514.19, for which bills were rendered to the bureau of lands. Surveys, investigations, and estimates have been made on 22 projects, involving proposed repairs to dams, tunnels, retaining walls, and buildings on 7 Friar land estates in the provinces of Laguna, Cavite, and Bulacan, the estimated cost of which is ₱59,500, which should be available at an early date.

The municipal council of Tanauan, Batangas, requested that an investigation survey and estimate be made as to the feasibility of installing a system of irrigation in the neighborhood of Tanauan. The source of water was the San Juan River. As this was a private enterprise, it was undesirable for the government to detail engineers to make plans, surveys, and estimates when such work could probably be done by engineers in private practice. However, it was recommended that the use of water from the San Juan River for irrigation purposes be granted, provided it did not interfere with prior rights.

Señor José Acosta, a resident of San Nicolas, Ilocos Norte, requested authority to restore an irrigation dam and ditch which was built by him in 1887 in order that he might use the waters of the Pamacutan River for irrigation purposes. It was recommended that the request be granted, but that the grant become revocable whenever an irrigation project of larger public benefit be inaugurated. The secretary of commerce and police authorized an inspection of the irrigation project at Ambalangan-Dalin under date of July 13, 1906, to be paid from insular funds. Mr. E. S. Wheeler, district engineer, was authorized to make the investigation and reported that a dam 366 meters long had been constructed with voluntary labor by the town of Asingan for the purpose of diverting the Agno River waters and which has been repaired in a temporary way for a number of years. The principal difficulty of the present dam lies in the formation of sand and gravel bars at the mouth of the intake necessitating their removal periodically. Owing to the character of the river bed at this point permanent works that would obviate this necessity would be expensive and justified only in case of a general demand for water for dry season crops. If the Agno River were properly controlled at this point it is estimated that an area of four to six thousand hectares could be placed under irrigation. Final action on this project is delayed pending special irrigation legislation.

Señor José M. Larma, a resident of the municipality of Balanga, Bataan Province, in his own name and on behalf of 4 other residents of the same municipality, forwarded a petition to the Philippine Commission that action be taken on their request to reconstruct an irrigating ditch then in disuse on account of lack of maintenance and repairs. A brief inspection of this project showed that the reconstruction of this irrigation system would result in an irrigable area of approximately 240 hectares, and in case construction was accomplished under the plan presented by the petitioners, the estimated cost would be ₱13.75 per hectare. The proposed plan was to rebuild the ditch and canal by the voluntary subscriptions of 20 farmers. These farmers were to constitute a board to manage the ditch and canal for the best interests of the community. In return for their services and subscription they were to be allowed free water for the irrigation of their fields. Those who failed to contribute their share would be compelled to pay an annual rental of two or three cavans of rice per hectare. It was proposed that regulations be prepared by the managers regarding the payment of quotas or rents, subject to the approval of the provincial board of Bataan, which should be observed by all landowners wishing to use the waters of the canal. Final action on this project is pending.

Under date of June 7, 1907, the Governor-General requested an examination for the purpose of determining what measures should be taken to prevent threatened destruction of an important irrigating ditch in the vicinity of Bayombong, Nueva Vizcaya, by the encroachment of the Magat River and estimates of the cost thereof. This canal, commonly called the San Vicente Canal, was constructed about sixty years ago by Padre Juan Villaverde. Its intake is on the Magat River about 8 kilometers above Bayombong. It is about 9 meters wide and 24 kilometers long. It serves an area of about 6,500 hectares containing a population of 1,500. The investigation as carried out showed that at a point about 1 kilometer south of Bayombong the Magat River had widened its flood plain and eroded its northerly bank until it had encroached upon the canal, washed away its bank for some 60 meters, and threatened complete destruction to approximately 240 meters more. It was recommended that a permanent dike or bulkhead 420 meters long be constructed across the eroded opening and parallel to the natural channel of low water of the river, and also 7 short jetties aggregating a total length of 300 meters. The jetties when constructed will interfere with the destructive energy of the swift-flood currents along the line of the canal. The estimated cost of this project was ₱11,775, and, in view of its importance to the agriculturists of Bayombong, government aid is practically assured under proper regulations. Various minor irrigation projects have been investigated and reports thereon submitted.

TARLAC RIVER CONTROL.

The destructive results of the Tarlac River floods upon adjacent fertile lands and upon the railroad embankment, and its serious effect upon the flood stages of the Pampanga River system, has been described in previous reports. As a result of the survey of 1905 the proposed work was divided into 4 sections, the accomplishment of any one of which would aid in the protection of adjacent property from damaging inundations during floods. The most urgent need for the control of the river was along the first section, from and through the municipality of Tarlac to the junction of the Tarlac-Victoria road with the railroad grade.

This section of the project consisted of four divisions: (a) A dike along the main road in the municipality of Tarlac from the old government building to the intersection of the road to the Tarlac railroad station with the Tarlac-Victoria road—a length of about 1,800 meters. (b) The closing of the Cut-cut River by a reinforced concrete culvert 8.5 meters long and a dam, provisions being made for the passage of water for irrigating purposes through the dam by means of a steel gate, dimensions, 0.9 meters by 1.2 meters. (c) The construction of pile jetties into the river for a distance of 123 meters, diverting the destructive flood current from the dike. (d) Where the floods had worn deep channels across the road the new dike was to be protected from scour by driving rows of piling at the toe of the dike.

Work was started on the project May 8, 1906, under the supervision of Mr. J. C. Koch, assistant engineer, and at the beginning of the fiscal year 1907 there had been completed 117 meters of jetty consisting of 2 rows of piles with a brush and stone fill; the Cut-cut Culvert and Dam with gate and tunnel was under headway, and the work of closing the gaps in the roadbed was in progress.

Owing to heavy rains and the resulting damage to work in progress all earth work was suspended until the close of the rainy season. There had been expended a total of ₱7,911.37. During the first part of the fiscal year the work was continued under the direction of Mr. Koch. In August Mr. S. C. Phipps, assistant engineer, was designated as acting district engineer, and assumed control of the Tarlac dike in connection with his other duties.

The construction of the concrete work at the Cut-cut River was completed during the latter part of the rainy season, and it accomplished the work for which it was designed—the providing of water for irrigation purposes and the controlling of flood water. The pile jetty, 123 meters in length, extending from the high ground at the site of the old Provincial building above the old channel of the Cut-cut River into the river channel was finished. The jetty has deflected the current to a considerable extent and the channel above the jetty is filling up with sand in a satisfactory manner. Mr. S. V. Cortelyou, district engineer, returned from the United States in the early part of December, 1906, and immediately took over the supervision of the Tarlac River control. Work on the pile dikes, which were located where the river formerly overflowed and washed out channels through the streets of Tarlac, was continued, and 274 meters of the dike are now protected from destructive flood currents.

Work on the earth dike was resumed on February 1, 1907. The dike is 4.5 meters wide on top and has slopes of 2 to 1 and $1\frac{1}{2}$ to 1 on the river and on the back slopes, respectively. The embankment in this section is composed of about 6 parts of clay to 1 of sand. The clay is a fair quality of red clay containing some sand and gravel. The sand was taken from the Tarlac River. The clay was delivered in two ways: First, in dump cars on a tram track, an average haul of 1,100 meters, at an average cost per cubic meter of ₱0.468; second, in carts hauled by a 12-ton traction engine, an average distance of 760 meters, at an average cost per cubic meter of ₱0.543. The second method not only increased the rate of progress, but also rolled the dike thoroughly. A temporary bridge was constructed across the Tarlac River and a track laid across to a large sandbar. Sand was brought in dump cars and delivered and spread along the dike at an average cost of ₱0.369 per cubic meter.

A trench 1.5 meters in width was dug along the toe of the dike sufficiently deep to reach the underlying layer of clay. The trench was then filled with alternate layers of clay and sand of the same proportions as those used in the dike. The original formation in the last 730 meters of the project is a sandy clay covered by a layer of sand from 0.3 to 1.2 meters in thickness. The work of constructing an embankment of this material with 4.5 meters top width and side slopes $1\frac{1}{2}$ to 1 was let by contract to the laborers at a peseta per cubic meter of embankment made. A group of four or five laborers combined and took a section 15 meters long—upon completing this another section was assigned to them. By this method the laborers are able to work during the coolest hours of the day, less supervision is required, and the laborers have an incentive to work harder. This portion of the embankment containing 45,936 cubic meters was completed in eighteen working days at a total cost, including wages of capataces, of ₱0.226 per cubic meter.

On the river slope of this embankment a layer of clay was placed 0.9 meter in thickness, and extending from the top of the dike down to the layer of clay in the bottom of the trench excavated at the toe of the dike. Cogon grass is being planted on both of the side slopes for the purpose of making them more capable of resisting the action of the river current. From February 1 to June 1, 1907, there were loaded, hauled to the dike, unloaded, spread, and rolled 14,143 cubic meters of material, which cost ₱7,274.81, or nearly ₱0.533 per cubic meter. The principal work remaining to be done on the first section consists of placing a durable surfacing of gravel over the embankment already built, the construction of a jetty 21 meters in length, construction of controlling work for an irrigating ditch, and the maintenance of the work accomplished.

The original project contemplated the continuation of this work from Tarlac to Paniqui, a distance of 21.7 kilometers, the estimated cost of which was ₱444,000. The first section has been practically completed. It is important that provision should be made for the continuation of this dike to a point beyond the Albindia River, a recently created river, which carries the flood water of the Tarlac into the watershed of the Pampanga River with destructive results. This section is 4 kilometers in length and its continuation should be along the general lines followed in the construction of the first section. The estimated cost for the continuation of this work to a point beyond the Albindia River is ₱195,000.

FINANCIAL STATEMENT.

Popular contribution (outstanding ₱1,839)-----	₱4, 799. 29
Provincial appropriation-----	3, 000. 00
Municipal appropriation-----	1, 000. 00
Resolution of the Commission May 1, 1906-----	16, 000. 00
	<hr/>
	24, 799. 29
Expended fiscal year 1906-----	7, 911. 37
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	16, 887. 92
Resolution of the Commission January 24, 1907-----	29, 000. 00
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	45, 887. 92
Expenditures fiscal year 1907:	
Cut-cut Dam-----	₱2, 931. 26
Pile jetty-----	2, 106. 67
Pile dike-----	3, 728. 41
Earth dike-----	8, 646. 54
	<hr/>
	20, 412. 88
Balance available July 1, 1907-----	25, 475. 04

ARTESIAN WELLS.

No other expenditures have been made by this bureau which show such high values to the community served. In many localities the death rate has been materially decreased by the use of artesian well water. The supply has in a few places furnished water to inhabitants of adjoining barrios within a radius of 4 or 5 kilometers.

Requests for artesian wells, where this method of securing a water supply is advantageous, have steadily increased, and the demand is far beyond the capacity of the present outfit. The success of a well in one municipality has caused adjacent municipal councils to pass resolutions authorizing a well within the limits of their municipality. Private contractors have been urged to enter this field, but so far without avail, with the exception of one contractor, whose services have been entirely with the army and navy. However, two additional well-drilling plants have been ordered, one of which is now en route from the United States.

Provisions for charging interested municipalities with the cost of successful wells drilled were made by resolution of the Commission under date of July 30, 1906.

Twenty-seven requests are now on file in this office for artesian wells, as follows: Ambos Camarines, 1; Batangas, 2; Bohol, 1; Bulacan, 6; Cebu, 2; Ilocos Sur, 1; Iloilo, 2; La Laguna, 2; Mindoro, 1; Pampanga, 2; Palawan, 1; Pangasinan, 1; Rizal, 1; Surigao, 1; Tarlac, 1; Tayabas, 2.^a

MISCELLANEOUS PROJECTS.

Malacañan wall.—The old wall along the Pasig River at the rear of the Governor-General's residence was originally constructed of Guadalupe stone laid in lime mortar. It had recently eroded at the water level and at places was badly cracked. The mortar had disintegrated to such an extent that the wall had settled and some courses had been forced several centimeters beyond the face. Its condition was unstable. Investigations were made, and plans and specification were drawn up for the reconstruction of 116 meters of wall north of the boat slip, and after due advertisement the contract was entered into with Mr. J. E. Ainsworth, contractor. The work is now in progress. The remainder of the old wall below the slip is being repaired under administration. Plans are pending for the removal of the old slip and for making changes in that part of the palace which overhangs the river, so that ultimately the whole work, when completed, will conform to the new harbor lines.

Bayabas and Norzagaray rivers.—Upon request of the provincial governor of Bulacan, investigations were made to ascertain the feasibility of removing ob-

^aA table showing number of wells drilled during the year and cost has been omitted and is on file in the Bureau of Insular Affairs, War Department.

structions which prevented the safe passage of timber rafts from the upper stretches of these rivers. The obstructions on the Bayabas River had heretofore prevented all rafting; the Norzagaray or Angat River is, on the contrary, one of the important rivers of the islands. In two localities on the Norzagaray River the channel was so tortuous and rapid that only at certain seasons could rafts pass, and casualties were of frequent occurrence. Plans having been approved, the work of blasting the large boulders blocking the stream was commenced in May, and the project is rapidly nearing completion. This improvement will permit the transportation of larger timber rafts and render the valuable forests on the upper watersheds of these streams accessible to the market.

Several smaller projects have been completed among which are the following: A room on the first floor of the Oriente building was prepared for the use of the economic association of the Philippines. A fireproof document vault in the city hall of Manila was constructed for the use of the court of land registration. A stable was erected for the use of the bureau of agriculture at Alabang, Rizal. A survey was made of a boundary line between the subprovince of Amburayan and the provinces of Ilocos Sur and La Union, including the municipality of Taguding in said subprovince. Reconstruction of the Pasay road, province of Rizal, an approximate distance of 1 mile beyond the limits of Manila was accomplished, and an additional 320 meters cleared, ditched, and graded. The Taytay-Antipolo road, Rizal, was repaired with gravel surfacing over the impassable portions thereof. Insular funds were appropriated for this project.

A survey and estimate was completed for the reconstruction of the road between Santa Cruz and the barrio of Buyabud, Marinduque, the estimated cost of which was ₱17,100. Final action on this project is still pending.

Surveys and estimates were completed to determine the feasibility of protecting the municipality of Boac, Marinduque, during the flood stages of the Boac River, by the construction of a diverting dam or dike and a canal. The estimated cost was ₱2,700. Final action on this project is delayed pending acceptance of the same by the municipal authorities.

Numerous minor investigations, estimates, and reports have been submitted, in accordance with instructions from the Philippine Commission, or upon the request of provincial or municipal authorization.

General Office.—A system of cost-keeping with particular reference to the division of building construction and repair was installed in November and is giving satisfactory results. This system is being extended to other divisions of the bureau and it is proposed to expand it sufficiently to permit cost analysis of works actually in progress, in order that resulting advantages may be derived prior to the completion of a project.

The entire system of bureau accounting was changed in January, 1907, under regulations approved of by the auditor, and the greater part of the accounts of the bureau for the first half of the year were rewritten.

All the accounting for the office of the supervising railway expert was performed by this bureau up to the passage of act No. 1591, February 13, 1907.

The record work for all divisions of the bureau is increasing in volume and importance. The increase in the number of papers handled is about 25 per cent over the previous year, while the cost of same has been decreased by about 20 per cent. The Filipino clerks are advancing in typewriting; in the use of the English language and in office system, and their work along these lines is steadily improving. Considerable time has necessarily been spent by the more experienced clerks in instructing new appointees necessitated by the frequent changes occurring in the personnel of the Filipino clerks. Employees who have served two or three years are far more valuable than new appointees, and every effort is being made to retain the experienced men in the service.

The amount of work has materially increased in connection with the handling of property, materials, and supplies. Approximately 3,500 orders for the issuing of material have been made on the two principal storehouses. The property division also performs the functions of a shipping office and the forwarding of supplies and materials to the various district engineers and public works throughout the islands requires the most detailed supervision. This work is being carried on as economically as possible under the existing conditions, and the expenses therefor can be materially reduced when the various storehouses and storage rooms can be consolidated.

An unstable condition still exists in the personnel. Very few men now in the service of the bureau were connected with it prior to 1903.

The total vacation and accrued leave taken during the year amounted to two thousand seven hundred and seventy-six days.

This leave was equally divided between vacation and accrued leave. The total amount of leave actually taken was equivalent to an average of about twenty-five days per annum for each employee entitled to the advantages of vacation and accrued leave, or to about 40 per cent of the leave earned. About 20 per cent of the allowable vacation leave was taken during the year.

In the employment of technical men the bureau has not been able to secure promptly the forces needed, mainly on account of the small entrance salary offered, while practically equal salaries have prevailed throughout the States, and to the fact that tenure of office and promotions in the Philippine service are problematic.

It is impossible to make a comparison of the efficiency and economy attained through compliance with the regulations of the civil-service bureau, as this bureau has not been operated under any other system. Compliance with its regulations has, however, assisted in the attainment of uniformity of salaries, in securing available information regarding employees, especially irresponsible applicants, and has saved the expense of an employment division within this bureau. The responsibilities and work devolving upon the employees have increased more rapidly than it has been possible to increase the number of employees. The efficiency shown by the employees and the extra hours of service given so constantly throughout all divisions merits the highest praise.

Financial statement, administration appropriations, bureau of public works, fiscal year 1907.

CREDITS.

Appropriation, act No. 1527-----	₱669,523.00
Appropriation, act No. 1660-----	33,400.00
Transfer from Friar lands fund-----	25,000.00
Total-----	₱727,923.00

DEBITS.

Expenses fiscal year 1907 paid to date-----	637,562.86
Balance-----	90,360.14
Outstanding obligations fiscal year 1907-----	₱50,000.00
Less refund to Friar lands fund-----	4,725.04
	54,725.04
Available for return to general funds-----	35,635.10

EXPENSES.

General office-----	₱61,009.92
Building division-----	182,272.94
Engineering division-----	20,998.73
Division of building superintendence-----	44,562.90
Maintenance of storerooms-----	13,599.79
Drafting division-----	10,942.28
Division of the Benguet road-----	83,119.77
Division of well drilling-----	16,925.97
Division of supervising railway expert-----	12,293.27
Division of the consulting architect-----	22,400.19
Provincial division, including the offices of the district engineers--	204,094.00
Maintenance of equipment-----	3,055.63
Purchase of new equipment-----	12,197.47
Total-----	637,562.86
Outstanding obligations-----	50,000.00
Balance-----	687,562.86

^a Includes cost of surveys, plans, and examinations for projected improvements.



TYPICAL REENFORCED CONCRETE SLAB CULVERT, PANGASINAN.



SAN JACINTO REENFORCED CONCRETE ARCH—60-FOOT SPAN—PANGASINAN.



TYPE OF SMALL REENFORCED CONCRETE CULVERT, RIZAL



TYPE OF STEEL TRUSS BRIDGE—110-FOOT SPAN—MANALO, CAVITE.

INCOME.

For services rendered to other bureaus and branches of the government, including superintendence by district engineers, reimbursement for which has been or will be made to this bureau----	₱83, 449. 89
For cost of office of the supervising railway expert to be paid by the Philippine Railway Company, advice of which has not yet been furnished by the auditor-----	15, 160. 44
Total-----	98, 610. 33

RETURN TO GENERAL FUND.

For services rendered during the fiscal year 1906, which have been paid and turned in-----	₱18, 671. 50
Amount of unpaid bills rendered for services as stated above-----	3, 900. 79
Total-----	22, 572. 29
Respectfully submitted.	

J. W. BEARDSLEY,
Director of Public Works.

The SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.



APPENDIX D.
REPORT OF THE CONSULTING ARCHITECT.

OFFICE OF THE CONSULTING ARCHITECT,
Manila, P. I., August 23, 1907.

SIR: In accordance with your instructions I have the honor to submit the following report for the fiscal year ended June 30, 1907.

The work below enumerated has been performed and for the purpose of this report is divided into the following classes:

A. Projects for which complete working plans and specifications have been prepared.

B. Projects for which complete plans and specifications are in course of preparation at the present time.

C. Projects for which preliminary plans have been furnished and are now under consideration.

D. Plans for the improvement of the city of Manila.

E. Plans for the improvement of Bagulo.

F. Plans for the improvement of other cities and towns.

A.

PROJECTS FOR WHICH COMPLETE PLANS AND SPECIFICATIONS HAVE BEEN PREPARED.

HOSPITAL, BILIBID PRISON.

This project includes, in addition to the hospital building, the inclosing of a tract of land immediately in the rear of the prison of approximately one hectare in area, with a reenforced concrete wall 17 feet high, the thickness thereof at the top being 20 centimeters and at the base 45 centimeters, and the spread of the foundations 2 meters and 43 centimeters. The wall is reenforced with bars placed both vertically and horizontally, resistance to wind pressure being the main consideration in the calculation of the amount of steel and the thickness of wall required.

The hospital building will be entirely of reenforced concrete and will contain two stories—four wards—each with a capacity of 75 beds, and a ward for females with provision for 20 beds. Operating rooms for major and minor surgical cases, isolation rooms, and the usual accessories of a modern hospital are also provided. The roof will be of concrete, practically flat, a portion of which is to be protected from the sun and rain by shelters of light construction. This is intended to give the tuberculosis patients the benefit of treatment in the open air.

This building, with the walls and guardhouses, will be built entirely by prison labor under competent supervision. The amount appropriated by resolution of the Philippine Commission, dated November 10, 1906, was ₱100,000.

INTERMEDIATE SCHOOL, LIPA, BATANGAS PROVINCE.

The plans provide for the remodeling of a large one-story building formerly used as a coffee mill. The changes involved are the division of space into class rooms, laying of new floors, resetting of window frames, and the addition of an arcade. The estimated cost of the improvement is ₱3,000.

INSANE WARD, SAN LAZARO HOSPITAL.

An addition of two stories to the main group of buildings of Spanish construction. It contains on each floor a large ward room with shower baths and water-closets, each ward accommodating 125 patients.

The walls and floors of this building, including the stairs, are of reenforced concrete. The only timber used in the building is that for the window frames and roof trusses.

This is the first building of reenforced concrete construction to be erected by the Philippine government. The appropriation for this work was ₱55,000.

ASSAY HOUSE, BUREAU OF SCIENCE.

A small building, constructed of native timber, immediately in the rear of the government laboratories. Cost, ₱1,372.50.

ENTRANCE GATE, BILIBID PRISON.

The gateway, with adjoining walls, is constructed of reenforced concrete. The gate is operated by a system of levers and wheels by guards stationed in one of the sentry boxes above the gateway. This work was constructed entirely by prison labor, under careful supervision. The amount allowed for the purchase of materials was ₱1,000.

ANIMAL HOUSES, BUREAU OF SCIENCE.

Buildings constructed of native timber for the purpose of sheltering small animals used for experimental purposes. The estimated cost of these houses is ₱12,000.

GATEHOUSE, RESERVOIR OF NEW WATERWORKS SYSTEM, MANILA.

A building, 8.33 meters by 6.20 meters, situated at the corner of the reservoir, for controlling the water supply. Floor and walls of reenforced concrete. The tile roof is supported on a semicircular vault of reenforced concrete. A design for a parapet wall surrounding the reservoir is included in this project. The cost of the gatehouse is estimated at ₱5,000.

PROVINCIAL GOVERNMENT BUILDING, ALBAY, ALBAY PROVINCE.

The revised plans provide for the construction of a second story on the walls of a building originally constructed by the Spanish Government for a prison. The first story is constructed of heavy stone walls. The plans provide for the second-story walls to be of reenforced concrete. The original building was examined by the consulting architect in December, 1906, and with the exception of the roof, was found to be in excellent condition. The building is 160 meters long and 134 wide and contains two interior courtyards. The lowest bid offered for the construction was ₱65,000.

CONSTABULARY OFFICERS' QUARTERS AND BARRACKS, ALBAY.

The plans provided for the construction of a second story of reenforced concrete on the stone walls of the former "Casa Gobierno" of Spanish construction. The extreme dimensions are, approximately, 24.9 meters by 30.6 meters.

This building, like the provincial government building, faces the public plaza of Albay. The lowest bid for the construction was ₱55,784.

HIGH SCHOOL BUILDING, ORANI, BATAAN PROVINCE.

The remodeling of a large building of Spanish construction belonging to the municipality. The lowest bid for the work was ₱12,486.

RESIDENCE FOR THE GOVERNOR-GENERAL, BAGUIO, BENGUET PROVINCE.

This building will form the central portion of the complete design. The first-story walls are of local stone and the second of Benguet pine, the building being so designed that the second-story walls may, at a later date, be replaced with reenforced concrete. A suite of large reception rooms is located on the first floor. Owing to the difficulty of securing materials and labor, a longer time is being taken for construction than was expected. The amount appropriated by the Commission was ₱30,000 and the amount of the lowest bid, not including plumbing, was ₱26,885.

PUBLIC MARKET, BAGUIO, BENGUET PROVINCE.

This building is to be situated in the business section and is to be constructed entirely of Benguet pine, the columns being of specially selected heart pine. The amount of the appropriation was ₱5,000.

TRADE SCHOOL, MALOLOS, BULACAN PROVINCE.

This is a building of one story with walls of reenforced concrete. A machine room located in the rear of the building will contain a dynamo for the purpose of supplying the public buildings with electric light. The estimated cost is ₱19,000.

TRADE SCHOOL, TUGUEGARAO, CAGAYAN PROVINCE.

A revised design for a one-story building of reenforced concrete walls similar to the building at Malolos. The estimated cost is ₱15,000.

HIGH SCHOOL, CAPIZ, CAPIZ PROVINCE.

This project consists of the remodeling of the provincial prison, constructed by the Spanish Government. The building faces the public plaza and is well located for school purposes. The extreme dimensions of the building, which contains two interior courtyards, is 39 meters by 62 meters. The design provides for the addition of a large assembly hall, to be used for public meetings as well as for school purposes. The lowest bid was ₱39,000.

TRADE SCHOOL, CEBU, CEBU PROVINCE.

A group of one-story buildings, to be constructed of native hard wood, at an estimated cost of ₱20,000.

TRADE SCHOOL, LAOAG, ILOCOS NORTE PROVINCE.

A one-story building, of reenforced concrete, 31 meters by 12 meters. The estimated cost is ₱19,000.

PUBLIC MARKET, PAGSANJAN, LA LAGUNA PROVINCE.

Construction of reenforced concrete for the columns and floors, and native hard wood for the trusses. By reason of its situation on the Pagsanjan River, excellent transportation facilities are provided. The dimensions are 17.5 meters by 57 meters. The estimated cost of this building is ₱14,000.

TRADE SCHOOL, SAN FERNANDO, LA UNION PROVINCE.

A one-story building, 12.04 meters by 36.5 meters, constructed of stone, with an extension in the rear 21 meters long. The estimated cost is ₱14,000.

PROVINCIAL SCHOOL, BONTOC, LEPANTO-BONTOC PROVINCE.

The plans provide for a one-story building, to be constructed of native pine, around three sides of a court. ₱3,000 have been appropriated for this work.

PROVINCIAL PRISON, CALAPAN, MINDORO PROVINCE.

A one-story building, 13 meters by 29.5 meters, to be constructed of native hard wood with concrete floors. The estimated cost of materials is ₱6,250.

TRADE SCHOOL, BACOLOD, OCCIDENTAL NEGROS PROVINCE.

A one-story building, 12 meters by 31 meters, with a forge room adjoining at the rear. Constructed of reenforced concrete at a cost of ₱16,000.

PROVINCIAL SCHOOL, SAN JUAN DE GUIMBA, NUEVA ECIJA PROVINCE.

A two-story building, constructed of native hard wood. The plans provide for 5 class rooms, a principal's office, supply room, and a large assembly hall. The estimated cost is ₱26,000.

PROVINCIAL SCHOOL, BAYOMBONG, NUEVA VIZCAYA PROVINCE.

This building is similar to that at San Juan de Guimba.

BODEGA, IWAHIG, PALAWAN PROVINCE.

A storehouse adjoining the pier, to be constructed of reenforced concrete, for the purpose of containing supplies for the penal settlement. The estimated cost of the materials is ₱1,700.

HIGH SCHOOL, SAN FERNANDO, PAMPANGA PROVINCE.

The design provides for a building containing 10 class rooms, with large assembly hall on the second floor. The first-story walls are to be of reenforced concrete; the second-story walls and floors of first group native hard wood. The dimensions are 16.28 meters by 38.03 meters. The amount of the lowest bid offered was ₱42,500.

PROVINCIAL GOVERNMENT BUILDING, SAN FERNANDO, PAMPANGA PROVINCE.

The plan provides for construction of reenforced concrete throughout for walls, floors, and stairways. All timber used to be of first group native hard wood. Roof of pressed cement tile. The dimensions are 34.16 meters by 20.26 meters, the amount of the contract being ₱69,787.

INTERMEDIATE SCHOOL, BINALONAN, PANGASINAN PROVINCE.

Two sets of plans have been prepared—one providing for timber construction throughout, the other for first-story walls of brick. The building contains 10 class rooms, with a large assembly hall on the second floor. The dimensions are 42.40 meters by 19.50 meters, the estimated cost being ₱40,000.

PUBLIC MARKET, PASIG, RIZAL PROVINCE.

Construction of reenforced concrete piers and concrete floor. Dimensions, 17.5 meters by 57 meters. Actual cost, approximately, ₱10,000; the location near the river permitting the delivery of materials at a low cost.

PROVINCIAL GOVERNMENT BUILDING, PASIG, RIZAL PROVINCE.

Construction of reenforced concrete throughout walls, floors, and stairways, is provided by these plans. Such timber as is used to be of first group native hard wood, with roof of pressed cement tile. Owing to its being situated on soft ground, heavy piling is necessary. The contract price is ₱97,600.

SCHOOL OF FISHERIES, MALABON, RIZAL PROVINCE.

The plan provides for the construction of a building utilizing existing stone walls of Spanish construction. The plan includes a large room to be used as an aquarium. The lowest bid was ₱16,945.

TRADE SCHOOL, CATBALOGAN, SAMAR PROVINCE.

The dimensions of this one-story building are 31 meters by 12 meters, construction to be of reenforced concrete at an estimated cost of ₱19,000.

MUNICIPAL SCHOOL, DINAGAT, SURIGAO PROVINCE.

This is a one-story building to be constructed of native hard wood. The plan provides for three class rooms and the estimated cost is ₱3,600.

PROVINCIAL GOVERNMENT BUILDING, TARLAC, TARLAC PROVINCE.

This building is to be constructed entirely of reenforced concrete and is to be two stories in height, the dimensions being 29.10 meters by 16.90 meters, and the estimated cost ₱64,000.

PROVINCIAL SCHOOL, IBA, ZAMBALES PROVINCE.

This is a two-story building to be constructed of native hard wood. Five class rooms are provided for, with a large assembly room on the second floor. The amount of the lowest bid was ₱26,800.

DAIRY BARN, ALABANG STOCK FARM, MUNTINGLUPA, RIZAL PROVINCE.

A shelter containing stalls for 48 cows and including a dairy room, to be constructed of concrete and native hard wood at the government stock farm at Alabang. The amount appropriated was ₱6,000.

B.

PROJECTS FOR WHICH COMPLETE PLANS AND SPECIFICATIONS ARE IN COURSE OF PREPARATION.

PUBLIC SCHOOL, TONDO, MANILA.

A two-story building containing 12 class rooms and a large assembly hall, to be constructed of reenforced concrete. The site adjoins the Tondo Church and includes a large playground. The extreme dimensions are 52.8 meters by 41.2 meters. The amount appropriated is ₱100,000.

MUNICIPAL BUILDING AND SCHOOL, LIBON, ALBAY PROVINCE.

This is a one-story building of native hard wood. The estimated cost is ₱7,300.

MUNICIPAL SCHOOL, SANTO TOMAS, BATANGAS PROVINCE.

This is a building of one story, to be constructed of local stone. Dimensions, 11.1 meters by 24.1 meters. The estimated cost is ₱6,000.

TRADE SCHOOL, BATANGAS, BATANGAS PROVINCE.

A one-story building of native hard wood, measuring in extreme dimensions 9 meters by 32.4 meters. The estimated cost for materials is ₱5,487.

CIVIL SANITARIUM, BAGUIO, BENGUET PROVINCE.

The site reserved for this institution is a pine-covered ridge commanding a fine view of the Bued River canyon and Mount Santo Tomas, and oriented in such a manner that all the wards and private rooms have the benefit of the morning sun. The sanitarium will be protected by higher hills toward the west, the direction from which severe storms usually come. The top of the ridge is to be leveled to furnish a convenient and proper setting for the buildings.

The main building is to be 60 meters in length, the wards being at the ends and the operating and administrative rooms in the central portion. The second floor contains 6 private rooms. The plans provide for construction of Benguet pine, with masonry foundations and chimneys of reenforced concrete. The amount appropriated is ₱50,000.

PRESIDENCIA, QUINGUA, BULACAN PROVINCE.

A two-story building containing the municipal offices. The walls are to be of reenforced concrete, the balance of construction of native hard wood. The dimensions are 10.5 meters by 13.5 meters, and the estimated cost is ₱13,000.

PRESIDENCIA, BALIWAG, BULACAN PROVINCE.

The plans for this building are similar to those adopted for Quingua, with the exception of the dimensions, which are 16.2 meters by 20.2 meters. The estimated cost of this building is ₱27,259.

PROVINCIAL PRISON, CAPIZ, CAPIZ PROVINCE.

This is a one-story building, to be constructed of native hard wood with concrete floors. The dimensions are 13 meters by 29.5 meters, and the estimated cost of the materials is ₱6,250.

HIGH SCHOOL AND TRADE SCHOOL, CAVITE, CAVITE PROVINCE.

Two adjoining buildings constructed under the Spanish Government are to be remodeled. The construction is mostly of stone and brick masonry. The estimated cost of this work is ₱8,000.

HIGH SCHOOL, CEBU, CEBU PROVINCE.

This school building will contain 10 class rooms and a large assembly room in two stories. The walls are to be of reenforced concrete; the floors and other construction of native hard wood. The outside dimensions are 18.5 meters by 41.45 meters, and the cost is estimated to be ₱66,000.

HIGH SCHOOL, SANTA CRUZ, LA LAGUNA PROVINCE.

This building will contain 10 class rooms and an assembly room on the second floor. The first-story walls will be of reenforced concrete. The second-story walls and the floors are to be of native hard wood of the first group. The estimated cost is ₱43,000.

TRADE SCHOOL, SANTA CRUZ, LA LAGUNA PROVINCE.

A building of one story, to be constructed with reenforced concrete walls. Extreme dimensions are 11.7 meters by 37.2 meters. This school differs from the usual trade school in that it contains a pottery school, the kilns being detached from the main building. Prison labor is to be used in the construction, the cost of the materials being estimated at ₱9,000.

CONSTABULARY BARRACKS, SANTO DOMINGO, LA LAGUNA PROVINCE.

This project consists of repairing the stone walls of a fortified post of Spanish construction and in erecting an upper story of timber upon the existing walls. The cost of the improvement is estimated at ₱18,500.

MUNICIPAL SCHOOL, BAYAMBANG, PANGASINAN PROVINCE.

A two-story building to contain 8 class rooms, to be constructed of native hard wood. The outside dimensions are 14.8 by 23 meters, and the cost is estimated at ₱20,000.

MUNICIPAL SCHOOL, BINALONAN, PANGASINAN PROVINCE.

The revised plans provide for a building 9.25 by 28.25 meters, containing 5 class rooms and an assembly room. The first-story walls are to be of local brick, the balance of construction of native hard wood. The estimated cost is ₱25,000.

MUNICIPAL BUILDING, ALAMINOS, PANGASINAN PROVINCE.

A two-story building to contain the municipal offices, to be constructed of native hard wood and to cost, approximately, ₱5,000.

TRADE SCHOOL, LINGAYEN, PANGASINAN PROVINCE.

A one-story building with reenforced concrete walls, the dimensions being, approximately, 13 by 50 meters. The cost of the materials is to be ₱20,000, the labor being supplied by prisoners.

HIGH SCHOOL, LINGAYEN, PANGASINAN PROVINCE.

This is to be a two-story building, constructed of reenforced concrete. Twelve class rooms are provided, with a large assembly hall. The dimensions are 25 by 47.5 meters. The building will be constructed with prison labor, the estimated cost of materials being ₱80,000.

This building, with the trade school above mentioned, is to form part of the group of provincial school buildings, allowing for the construction of dormitories and other buildings in the future.

MUNICIPAL SCHOOL, PASAY, RIZAL PROVINCE.

A one-story building, to be constructed of native hard wood and providing 5 class rooms, the estimated cost being ₱7,600.

HIGH SCHOOL, MASBATE, SORSOGON PROVINCE.

A two-story building containing 5 class rooms and an assembly room. The first-story walls are to be of reenforced concrete, the balance of native hard wood. The dimensions are 9.25 by 28.25 meters, and the estimated cost is ₱24,000.

MUNICIPAL SCHOOL, BULASAN, SORSOGON PROVINCE.

A building of one story, to be constructed of native hard wood. The plan provides for 4 class rooms and a principal's office. Extreme dimensions, 23 by 14.8 meters. The estimated cost is ₱11,500.

MUNICIPAL SCHOOL, PURA, TARLAC PROVINCE.

A one-story building to be constructed of hard wood, obtained locally, and containing 5 class rooms and an assembly room. Dimensions, 14 by 41 meters. The estimated cost is ₱22,500.

INTERMEDIATE SCHOOL, CAMILING, TARLAC PROVINCE.

This building is of two stories and provides for 5 class rooms and an assembly room. Construction throughout is to be of native hard wood. The dimensions are 9.25 by 28.25 meters, and the estimated cost is ₱24,000.

PROVINCIAL GOVERNMENT BUILDING, LUCENA, TAYABAS PROVINCE.

The design provides for construction throughout of reenforced concrete for walls, floors, and stairways. All timber used is to be native hard wood. Pressed cement tile will be used for the roof. The estimated cost is ₱85,000.

MUNICIPAL SCHOOL, TAYABAS, TAYABAS PROVINCE.

This project consists of the remodeling of a masonry building of Spanish construction. The cost is, approximately, ₱10,000.

Examination of the above list suggests the duplication of much of the work, especially in the case of school buildings. By the adoption of model types of school buildings, much of the work of drafting plans has been saved. While it seldom happens that the same detailed plans will suit any two cases exactly, it is found that with a few slight modifications the same general plans may be made to meet the conditions. Thus, the plan for a two-story building containing 5 class rooms and an assembly room, originally prepared for Masbate, was made to meet the conditions at Camiling, Tarlac, by changing the reenforced concrete construction of the first-story walls to timber, which is locally available; and again at Binalonan, Pangasinan, by making the first-story walls of brick, the local building material. In both cases the preparation of special plans was necessary, but after the first one had been completed the work of preparing the other two was considerably simplified.

The general plan of the trade schools now being erected has been the same for nearly all cases, but the local conditions necessitated variations in the materials and in some of the minor arrangements.

The public markets at Pasig, Rizal, and at Pagsanjan, La Laguna, were erected under the same local conditions from the same plans.

Unless the conditions are exceptional, each set of plans prepared for a public building becomes a model plan adaptable to other places under similar conditions. For this reason the possession of model plans for public buildings, constantly subject to modifications made in the light of experience, becomes a valuable asset.

Four of the buildings for provincial government offices, those of Pampanga, Rizal, La Laguna, and Tayabas, were designed under substantially the same local conditions. All are to be constructed of reenforced concrete throughout and the same floor plans were adopted in each case. The importance of these buildings seems to justify the additional effort of designing special façades in each instance.

C.

PROJECTS UPON WHICH PRELIMINARY PLANS AND ESTIMATES HAVE BEEN SUBMITTED.

During the year preliminary plans and estimates have been prepared for the following buildings, the construction of which is now under consideration:

Model pottery school, estimated cost, ₱3,500; offices, bureau of navigation, Engineers Island, estimated cost, ₱43,000; warehouses, Pasig River, estimated cost, ₱558,000; general hospital, Manila, estimated cost, ₱780,000; cottages, Bagulo, estimated cost, ₱22,000; dining hall, Bagulo, estimated cost, ₱8,000; Philippine School of Arts and Trades, estimated cost, ₱25,700; schools, Bagulo, estimated cost, ₱12,000; primary school, Tubigon, Bohol, estimated cost, ₱4,000; Presidencia, Bulacan, Bulacan, estimated cost, ₱16,000; prison, Malolos, Bulacan, estimated cost, ₱28,000; garrison, Iwahig, Palawan, estimated cost, ₱9,500; prison, Lingayen, Pangasinan, estimated cost, ₱28,413.

The combined estimated cost of these projects, according to preliminary plans, is ₱1,538,113.

D.

IMPROVEMENT OF THE CITY OF MANILA.

The most important work of the year has been the preparation of plans for the development of the reclaimed area and the Luneta extension, showing the

street system, railway terminal, docking facilities of the new wholesale commercial section, and the treatment of the Luneta extension as public gardens, with the adjoining areas reserved for semipublic purposes.

The plan of the Luneta extension is the development of the general scheme prepared by Mr. D. H. Burnham for this improvement, the design being definitely determined by the bulkhead which forms the outline of this extension.

During the year arrangements have been made for the sale of the club sites at the southern end. This section, containing 18,790 square meters, is divided into three lots, the one in the center being about twice the size of those at the ends. The plan suggests the arrangement of the buildings to be erected on these sites, placed in such a way as to afford each building the least possible obstruction to air and view. The central and largest lot was acquired by the Army and Navy Club and that adjoining the proposed boulevard by the Elks Club, the lot facing the bay alone remaining to be sold.

The conditions of the sale provide that the general design of the club buildings shall be subject to the approval of the consulting architect, the purpose of this provision being to obtain a general unity in the designs of the buildings facing the public gardens.

The site reserved for a hotel, approximately 164 by 205 meters, is to be sold at auction on July 5, an amendment to act No. 1360 having been made by the Commission, with provisions for the sale of this land at public auction, and allowing an exchange to be made for lands situated in the city of Manila. By this sale of the hotel site the government may acquire nearly all of the property necessary for the development of the Government Center, of which Calle Nozeleda is one of the radiating streets, and at the same time give the prospective hotel company full possession of this desirable location for a hotel, such possession making it possible to sell bonds to much better advantage than would be the case if the site were to be held on lease.

The filling of the Luneta extension by hydraulic dredge is now completed. While it would be possible to begin immediately the driving of piles, it is expected that by the end of the year the surface of the ground will be sufficiently hard to allow building operations to proceed without difficulty.

During the year a plan for grading the city moats was prepared and submitted to the municipal board. The plan provides for a system of surface drainage, this being considered more economical, both in initial cost and in maintenance, than underground drainage and more suited to the conditions. If funds are not at present available for completing this work it is believed important that a beginning, at least, be made on the improvement of the moats by grading and draining, in order to convince the public that the present unsightly and barren waste in the center of the city may be converted into a park of unusual beauty and unique surroundings.

On May 1 a committee of five was appointed by the Governor-General for the purpose of making investigations and preparing plans for the reservation of lands for parks in the city of Manila. The park system will include, in addition to the Luneta extension and the moat surrounding the Intramuros, several large parks in the outskirts of the city and playgrounds located in various sections, according to the probable future needs of the population. A preliminary plan showing the distribution of such parks and playgrounds, according to the principles indicated on the Burnham plan, with estimates of the value of the lands required, is in course of preparation.

E.

BAGUIO IMPROVEMENTS.

At Baguio the most important improvement has been the construction of, approximately, 9½ miles of the system of drives extending from the Baguio town site northward to Trinidad Valley and eastward to Pakdal. This system of drives makes accessible all the sections which have been subdivided into residence lots and sold at public auction, besides making these parts accessible by means of carromatas, victorias, or automobiles. In a few places only have the roads a gradient exceeding 5 per cent.

The recommendation made in the last report regarding the protection of the forests in Baguio and the immediate vicinity by burning a system of lanes was this year put into operation, with good results, at an expenditure of ₱350. A

few fires occurred, but they were confined to small areas and in no case gained sufficient headway to prove destructive to timber.

The peculiar topographical condition immediately west of Bagulo and east of Mirador promises to make possible the creation of probably the only element of natural beauty that Bagulo does not possess. This area, bounded by the Bagulo town site and Mirador, the Naquillan road, and the limestone cliffs, would now be a beautiful mountain lake were it not for a crevice in these cliffs, through which the waterfall of the surrounding hills and a constantly flowing stream, fed by springs, escapes and continues its course by a subterranean passage. This passage may be closed by means of a few cubic meters of masonry. Whether there are other crevices in these cliffs to permit the escape of water can not be definitely ascertained on account of the steepness and the growth of vegetation. A lake of about four hectares in area can be formed by closing the large crevice. Beyond that point the problem is experimental.

The greatest need of Bagulo, now that the roads have been constructed, and which would seem to encourage the construction of private dwellings more than anything else, is an adequate water supply. The most attractive building sites are those on or near the hilltops, where water can not be obtained except by hauling from springs at a much lower level.

Owing to the large area over which Bagulo extends, independent systems for the various sections could be obtained at much less expense than one general system. The townsite of Bagulo, the military reservation, Sunnyside, and Southside may best be supplied from the big spring near the end of the Benguet road. Brookside and Pakdal may be supplied from springs, although it is possible that there are enough springs on the hills north of Pakdal to supply the last-named section with a gravity system.

F.

IMPROVEMENT OF OTHER CITIES.

In some of the provincial cities the demand for new public buildings of a permanent character has suggested the advantage of grouping such public buildings, proposed for either immediate or future construction, in such a way as to suit the public convenience and contribute to the beauty of the surroundings.

The increase in the authority of the provincial governments has led to the necessity of providing suitable buildings for the transaction of official business and the safe-keeping of public funds and records. During the year, plans for six such buildings, with general designs for civic improvements, have been completed.

Albay, Albay Province.—The general plan adopted includes restoration of the buildings facing the public plaza constructed by the Spanish government in about 1850, providing by this means headquarters for the provincial government, the prison, and the district headquarters and barracks for the constabulary.

San Fernando, Pampanga Province.—A tract of land of 10.9 hectares, near the center of the town and the railroad station, has been acquired for public purposes. On this ground are being constructed the provincial government building and the provincial high school, with sites reserved for the industrial school, prison, and hospital.

Santa Cruz, La Laguna Province.—The conditions here are similar to those at San Fernando, Pampanga.

Pasig, Rizal Province.—The property reserved for public purposes is a tract averaging 50 meters in width and almost one-fourth of a mile in length, extending from the river to the center of Pasig. The provincial government building is being constructed near the banks of the Pasig. At the other end of the tract, the prison is being constructed, with space reserved for a court-house. The area between this and the provincial government building is to be treated as a sunken garden.

Lucena, Tayabas Province.—The conditions here are similar to those at San Fernando, Pampanga.

As a general principle, it may be said that the arrangement of public buildings in a logical, orderly, and convenient composition, and the execution of such buildings and approaches in permanent and durable materials, is the architectural expression of the same order, system, and permanency which should exist in the organization of any government.

The establishment of such civic centers can not fail to impress the public mind with the strength and stability of the government and should, therefore, be regarded as an educational influence of great value.

The value of the construction represented in the detailed plans and specifications completed, as shown in list A, is in accordance with the following tabulation:

Hospital, Bilbid Prison, amount appropriated.....	₱100,000.00
Intermediate school, Lipa, estimated cost.....	3,000.00
Insane ward, San Lazaro Hospital, appropriation.....	55,000.00
Assay house, bureau of science, actual cost.....	1,372.50
Entrance gate, Bilbid Prison, cost of material.....	1,000.00
Animal houses, bureau of science, estimated cost.....	12,000.00
Gate house, Manila reservoir, estimated cost.....	5,000.00
Provincial government building, Albay, lowest bid.....	65,000.00
Constabulary buildings, Albay, lowest bid.....	55,784.00
High school, Orani, Bataan, lowest bid.....	12,488.00
Residence for governor-general, Bagulo, lowest bid.....	26,885.00
Public market, Bagulo, appropriation.....	5,000.00
Trade school, Malolos, Bulacan, estimated cost.....	19,000.00
Trade school, Tuguegarao, Cagayan, estimated cost.....	15,000.00
High school, Capiz, lowest bid.....	39,000.00
Trade school, Cebu, estimated cost.....	20,000.00
Trade school, Laoag, Ilocos Norte, estimated cost.....	19,000.00
Public market, Pagsanjan, Laguna, estimated cost.....	14,000.00
Trade school, San Fernando, La Union, estimated cost.....	14,000.00
Provincial school, Bontoc, appropriation.....	3,000.00
Provincial prison, Calapan, estimated cost material.....	6,250.00
Trade school, Bacolod, Occidental Negros, actual cost.....	16,000.00
Provincial school, San Juan, estimated cost.....	26,000.00
Provincial school, Bayombong, estimated cost.....	26,000.00
Bodega, Iwahig settlement, estimated cost material.....	1,700.00
High school, San Fernando, Pampanga, lowest bid.....	42,500.00
Provincial building, San Fernando, contract sum.....	69,787.00
Intermediate school, Binalonan, estimated cost.....	40,000.00
Public market, Pasig, Rizal, actual cost.....	10,000.00
Provincial building, Pasig, contract price.....	97,600.00
School of fisheries, Malabon, lowest bid.....	16,945.00
Trade school, Catbalogan, Samar, estimated cost.....	19,000.00
Municipal school, Dinagat, estimated cost.....	3,600.00
Provincial building, Tarlac, estimated cost.....	64,000.00
Provincial school, Iba, Zambales, lowest bid.....	26,800.00
Dairy barn, Alabang, Rizal, appropriation.....	6,600.00
Total value.....	958,309.50

The following tabulation represents the value of the construction for which plans and specifications are in course of preparation, as shown in list B:

Tondo public school, Manila, appropriation.....	₱100,000.00
Municipal school, Libon, Albay, estimated cost.....	7,300.00
Municipal school, Santo Tomas, estimated cost.....	6,000.00
Trade school, Batangas, estimated cost materials.....	5,487.00
Civil sanitarium, Bagulo, appropriation.....	50,000.00
Presidencia, Quingua, Bulacan, estimated cost.....	13,000.00
Presidencia, Baliwag, Bulacan, estimated cost.....	27,259.00
Provincial prison, Capiz, estimated cost materials.....	6,250.00
High school, Cavite, estimated cost.....	8,000.00
High school, Cebu, estimated cost.....	66,000.00
High school, Santa Cruz, estimated cost.....	43,000.00
Trade school, Santa Cruz, estimated cost materials.....	9,000.00
Constabulary barracks, Santo Domingo, estimate.....	18,500.00
Municipal school, Bayambang, estimated cost.....	20,000.00
Municipal building, Alaminos, estimated cost.....	5,000.00
Trade school, Lingayen, estimated cost materials.....	20,000.00
High school, Lingayen, estimated cost materials.....	80,000.00
Municipal school, Pasay, estimated cost.....	7,600.00

High school, Masbate, estimated cost.....	₱24,000.00
Municipal school, Bulasan, estimated cost.....	11,500.00
Municipal school, Pura, estimated cost.....	22,500.00
Intermediate school, Camiling, estimated cost.....	24,000.00
Provincial building, Lucena, estimated cost.....	85,000.00
Municipal school, Tayabas, estimated cost.....	10,000.00
Total value.....	669,396.00

The aggregate cost of the projects for which preliminary plans and estimates have been prepared, as given in list C, on page 393, is ₱1,538,113.

The total value of construction in the projects handled by this office during the fiscal year was—

List A.....	₱598,309.50
List B.....	669,396.00
List C.....	1,538,113.00
Total.....	2,805,818.50

These estimates do not include the cost of the general improvement projects for the city of Manila, Baguio, and other cities.

During the year ended June 30, 1907, the following expenses were charged against this office:

Salaries and wages.....	₱31,730.20
Office supplies.....	700.68
Transportation and traveling expenses.....	1,862.37
Postage and telegrams.....	97.94
Total.....	34,400.19

Where plans have been required for advertisement for public bidding, or where the execution of the work was assured, it has been the practice of this office to prepare plans showing the details of construction as completely as possible.

In usual architectural practice the drawings upon which the contract is based are not fully detailed, but show in a general way only the quantities and qualities of materials to be required. It is the opinion of the writer that contractors will furnish a much closer bid if they know exactly what materials and labor will be required, and therefore that the fully detailed drawings should be made before the advertisement for bids rather than after.

In the case of work to be performed outside of Manila completely detailed drawings are considered an absolute necessity, as the inspectors of the bureau of public works in charge of the construction should never be left in doubt as to the exact meaning of the plans and specifications, especially where, in remote sections, serious delays would result if they were obliged to refer to the central office in Manila for instructions.

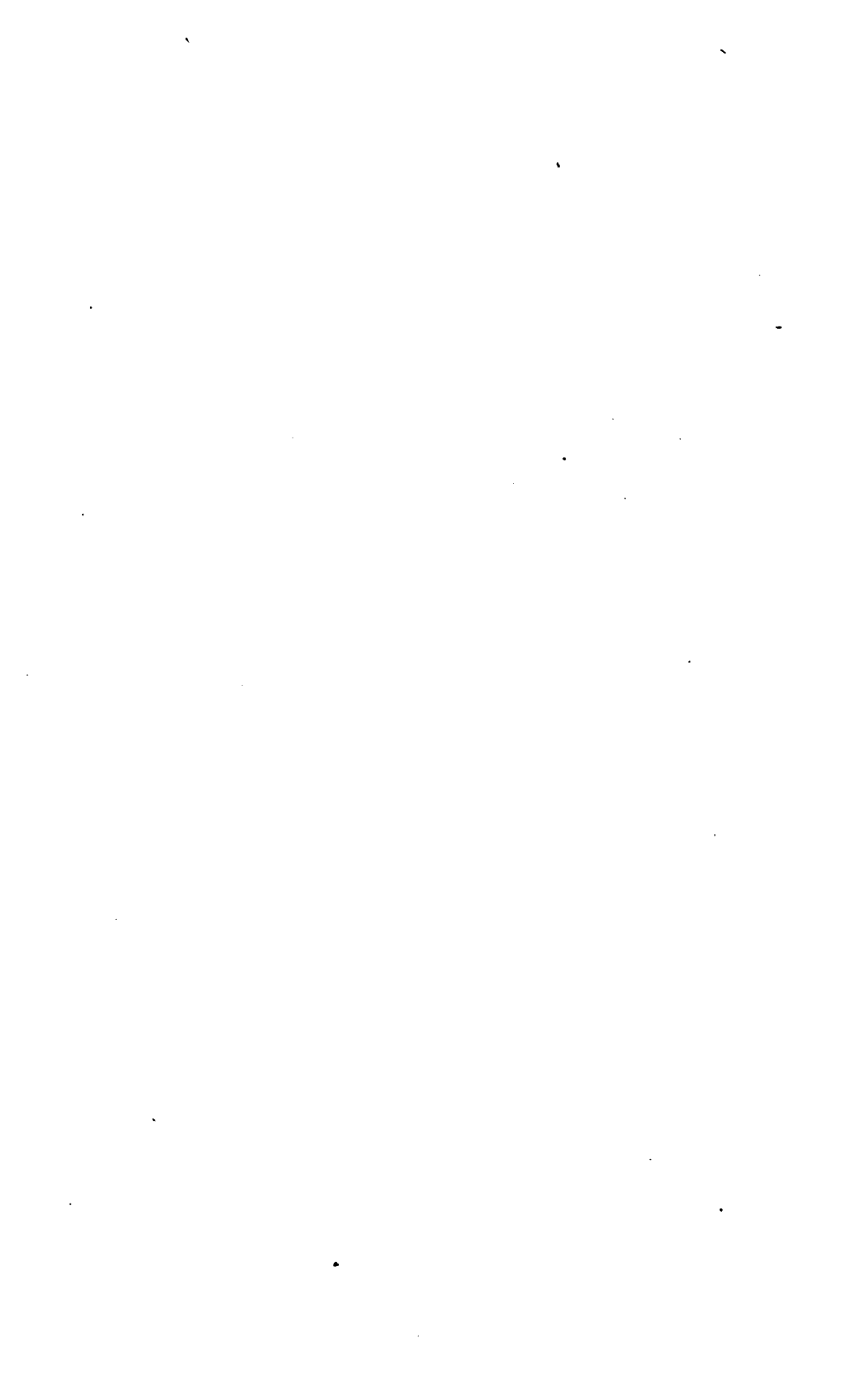
During the year the increasing volume of work has made it necessary to more than double the drafting force of the office.

The position of assistant architect is being filled temporarily by Mr. George H. Hayward, civil engineer. His services have been given to projects requiring a knowledge of civil engineering, such as improvement plans for the city of Manila, Baguio, and other places.

Respectfully submitted.

W. E. PARSONS,
Consulting Architect.

The SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.



APPENDIX E.

REPORT OF THE DIRECTOR OF POSTS.

OFFICE OF THE DIRECTOR OF POSTS,
Manila, P. I., October 15, 1907.

SIR: I have the honor to submit the following as the annual report of the bureau of posts for the fiscal year ended June 30, 1907:

PERSONNEL.

The following statement shows the number of persons employed in the bureau at the close of the year, together with position held, and the nationality of each:

Office or position.	Americans.		Filipinos.		Total.
	Classified service.	Unclassified.	Classified service.	Unclassified.	
Office director of posts.....	19	7	9	11	46
District inspectors.....	19				19
Postmasters.....	20	39	5	440	504
Post-office clerks and employees.....	41	6	63	88	198
Letter carriers, Manila.....			17		17
Operators.....		15		56	71
Linenmen.....	3	38		182	223
Railway post-office and steamboat postal clerks.....	1	1	4		6
Teamsters and drivers.....		1		6	7
Mail carriers and contractors.....		19		233	252
Total.....	108	126	98	1,016	1,343

The following statement shows the changes in the personnel which occurred during the year:

	Americans.	Filipinos.	Total.
Reinstated.....	4	5	9
Transferred from other bureaus.....	16	2	18
Appointed, classified service.....	6	21	27
Appointed, unclassified service.....	35	404	439
Temporary and substitute appointments.....	15	58	73
Transferred to other bureaus.....	6		6
Resigned, classified service.....	25	5	30
Resigned, unclassified service.....	20	224	244
Removals, classified service.....	5	2	7
Removals, unclassified service.....	23	124	147
Deaths.....	1	4	5
Temporary and substitute, discontinued.....	11	31	42

During the first part of the fiscal year an arrangement was agreed upon with the assistant executive secretary whereby as rapidly as possible the municipal treasurers in the smaller municipalities would be also appointed postmasters. On this account a considerable number of Filipino postmasters tendered their resignations to enable the appointment of the municipal treasurers. This explains the large number of Filipino resignations from and the appointment of so many Filipinos to unclassified positions.

REVENUES.

The following statement shows the gross revenues for this in comparison with those for the fiscal year ended June 30, 1906:

Item.	Fiscal year 1906.	Fiscal year 1907.	Estimated for 1908.
Stamp sales.....	₱425,261.50	₱607,206.44	₱631,000
Second-class postage.....	6,293.32	7,661.84	9,100
Miscellaneous.....	232.25	1,764.96	1,900
Box rents.....	16,651.52	17,182.39	18,000
Money-order fees transferred to postal funds.....	35,790.18	37,774.16	40,000
Total.....	484,228.77	671,586.81	700,000

The revenues collected on telegrams, amounting to ₱236,720.26, is included in the above statement of stamp sales. Of this amount ₱2,834.40 was collected on telegrams sent from military telegraph offices. Act No. 1527 and the subsequent deficiency appropriation act appropriated ₱80,671.74 for the signal service to be withdrawn from the appropriation for the bureau of posts, with the provision that the difference between the amount used and the amount of revenue collected by the bureau of posts on telegrams sent from military telegraph offices, less ₱5,200 allowed for checking the accounts of such offices, should be deposited in the insular treasury to the credit of miscellaneous receipts instead of to the credit of the bureau of posts. Therefore we must deduct the sum of ₱87,634.40, ₱2.11, funds lost in fire at Mariveles, and ₱31, funds lost in transit from Ilog, Negros Occidental Province, which leaves ₱583,919.30 as the net revenues of the bureau.

It is difficult to compare the revenues of this with the fiscal year 1906, owing to the fact that the law requiring the insular, provincial, and municipal governments to pay postage and telegraph charges did not become effective until January 1, 1906, but by comparing the revenues, including telegraph business, for the six months January to June, 1906, inclusive, amounting to ₱326,817.38, with the same period in 1907, in which they amounted to ₱349,644.08, we find the increase to be $7\frac{1}{2}$ per cent. It is not probable, however, that this rate of increase will continue for the year 1908, as the revenues for the last six months of the fiscal year 1907 were undoubtedly above the normal, since the revenues for the quarter ending December 31, 1906, were at least ₱30,000 below normal.

The increase in second-class postage collected is more than 22 per cent, and in box rents more than 3 per cent. Of the miscellaneous revenues, ₱152.22 consisted of money taken from dead letters which had been held in the dead letter office for more than one year. The balance represents property sold, collections from employees for property lost, and waste paper sold.

The real increase in money-order fees is more than 11 per cent, but as ₱1,700 of such fees for this year were used to pay the loss of that amount of money-order funds shipped from Manila to Masbate in March, 1906, the balance transferred to postal funds is less than 6 per cent greater than the amount transferred during the year 1906.

The revenues of the Manila post-office were ₱292,422.39, or 44 per cent of the whole.

EXPENSES.

The following is a comparative statement of the expenses for the fiscal years 1906 and 1907:

Item.	Fiscal year 1906.	Fiscal year 1907.	Estimated for 1908.
Salaries and wages (excepting railway and steamboat postal clerks, mail drivers, teamsters, contractors and carriers, and linemen).....	₱522,770.97	₱628,422.88	₱814,000
Mail transportation (including railway and steamboat postal clerks, mail drivers, teamsters, contractors and carriers' salaries).....	129,068.72	138,817.55	160,000
Construction, maintenance, and repairs of telegraph and telephone lines (including linemen's salaries and transportation).....	95,511.58	165,261.33	234,000
Contingent expenses.....	67,358.35	102,721.37	172,000
Total.....	814,734.62	1,065,223.13	1,380,000

The approximate cost of each division of the bureau of posts is as follows:

	Fiscal year 1906.	Fiscal year 1907.	Estimated for 1908.
Postal division.....	₱578,486.44	₱585,946.06	₱690,000
Money-order division.....	36,236.10	37,641.21	40,000
Telegraph and telephone division.....	200,002.08	394,242.49	590,000
Postal savings-bank division.....		37,393.35	60,000
Total.....	814,724.62	1,085,223.13	1,880,000

In determining these figures a fair proportion of the salaries and wages and other expenses of the offices of the director of posts and of post-offices has been charged to each division, but no credit has been given the postal division for the transportation of the mails of the other divisions.

In making a comparison of the expenses of the bureau for this year with the fiscal year 1906 it must be remembered that the expenses of the telegraph division for the first year are for six months only. However, it will be seen that the cost of the telegraph division for the last year was at the rate of ₱5,761.87 less per annum than the cost for the last six months of the previous year. This reduction was accomplished by further consolidations of the positions of postmasters and telegraph operators, although the salaries of the employees retained at the offices were materially increased. The reduction was even greater than this figure, as during the year we took over 9 additional telegraph offices and 58½ miles, or 94.1 kilometers, of telegraph lines from the signal corps.

The apparent reduction in the cost of the postal division, although there was an increase of ₱9,723.83 in the cost of mail transportation, is explained by the fact that the portion of office expenses charged to the telegraph division for the fiscal year 1906 pertains to six months only and that the postal savings bank division was not started until during the last year. The expenses of the telegraph and postal savings-bank divisions are commented upon under their respective heads.

The increase in the estimate of expenses for the year 1908 is caused principally by the fact that we will have all of the telegraph service in operation during this year.

POSTAL DIVISION.

The new postage and special-delivery stamps and books of postage stamps ordered during the fiscal year 1906 were received and placed on sale in August, 1906. The following is a description of the new stamps:

Denomination.	Portrait.	Color.
2-centavo.....	Rizal.....	Green.
4-centavo.....	McKinley.....	Red.
6-centavo.....	Magellan.....	Purple.
8-centavo.....	Legaspi.....	Dark brown.
10-centavo.....	Lawton.....	Blue.
12-centavo.....	Lincoln.....	Magenta.
16-centavo.....	Sampson.....	Dark lilac.
20-centavo.....	Washington.....	Light brown.
26-centavo.....	Carriedo.....	Slate.
30-centavo.....	Franklin.....	Olive.
1-peso.....	Coat of arms.....	Orange.
2-peso.....	Coat of arms.....	Black.
4-peso.....	Coat of arms.....	Sapphire blue.
10-peso.....	Coat of arms.....	Dark green.

The design of the 20-centavo special-delivery stamp is a view of Mount Mayon with a Filipino messenger boy in the foreground, and the color is light blue.

The stamp books are of two sizes and kinds: One containing 24 2-centavo stamps and the other 12 4-centavo stamps, and each kind sells for 50 centavos per book. On the cover of each book there is printed a brief statement calling attention to the advantages of the special-delivery, registry, money-order, and postal savings-bank systems, printed in both English and Spanish.

The 14 plates for the new postage stamps cost ₱5,958.10, which expense will not again be necessary until the plates are worn out or new designs are

adopted. The 2, 4, 10, and 20 centavo stamps are manufactured at a cost, exclusive of the plates, of ₱0.16132 per thousand, and the other denominations cost ₱0.24758 per thousand. The cost of the plate for the special-delivery stamp was ₱115.40, and the cost for the manufacture of the stamps, exclusive of the plate, is ₱0.49518 per thousand. The stamp books containing 12 4-centavo stamps cost ₱7.185 per thousand and those containing 24 2-centavo stamps ₱8.506 per thousand, exclusive of the cost for the printing of the stamps, which is the same as for those printed in sheets.

Subsequently, orders were placed for the manufacture of new postal cards, envelopes, and newspaper wrappers. Two kinds of postal cards were ordered, 2-centavo and 4-centavo, single. No double postal cards—one-half being a reply part—were ordered, as heretofore there has been only a very small call for them. Three kinds of stamped envelopes were ordered, 2-centavo and 4-centavo letter size and 4-centavo official size. The order for the newspaper wrappers is for the 2-centavo kind. The first supply of these new postal cards, envelopes, and wrappers is expected to arrive by the next mail from the United States.

When the new postage and special-delivery stamps were placed on sale all outstanding stamps of the old issue in the hands of postmasters were called in and destroyed by a special committee of three appointed by the Governor-General. In all, this committee destroyed stamp stock to the value of ₱232,356.82. By calling in and destroying this old stock the possibility of confusion on the part of Filipino postmasters was materially reduced, and at the same time it enabled us to get rid of a considerable amount of stamp stock in the hands of postmasters which had become more or less damaged.

On July 1, 1906, we had 476 post-offices established. During the year 26 new offices were established and 3 reestablished, so that at the close of the fiscal year there were 505 post-offices, distributed as follows:

Province.	Number of municipalities.	Number of post-offices in municipalities.	Number of post-offices in barrios.	Total number of post-offices.
Albay.....	22	13	0	13
Ambos Camarines.....	35	27	1	28
Antique.....	11	7	0	7
Bataan.....	8	6	0	6
Batangas.....	17	16	0	16
Benguet.....	16	1	1	2
Bohol.....	33	15	0	15
Bulacan.....	15	13	0	13
Cagayan.....	22	13	0	13
Capiz.....	22	14	0	14
Cavite.....	13	11	1	12
Cebu.....	41	33	0	33
Ilocos Norte.....	10	10	1	11
Ilocos Sur.....	21	13	1	14
Iloilo.....	17	15	1	16
Isabela.....	10	7	0	7
La Laguna.....	21	17	1	18
La Union.....	12	12	0	12
Lepanto-Bontoc.....	21	4	0	4
Leyte.....	36	21	0	21
Manila.....	1	1	0	1
Mindoro.....	8	1	0	1
Misamis.....	11	10	0	10
Moro.....	15	11	3	14
Negros Occidental.....	22	22	1	23
Negros Oriental.....	14	14	1	15
Nueva Ecija.....	14	13	0	13
Nueva Vizcaya.....	6	5	0	5
Palawan.....	6	4	1	5
Pampanga.....	16	16	2	18
Pangasinan.....	41	32	0	32
Rizal.....	19	14	1	15
Romblon.....	6	1	0	1
Samar.....	32	15	0	15
Sorsogon.....	29	21	0	21
Surigao.....	12	6	0	6
Tarlac.....	11	10	0	10
Tayabas.....	24	18	0	18
Zambales.....	8	7	0	7
Total.....	697	489	16	505

It was intended that during the last year the postal service would be extended until a post-office was established in each municipality outside of the non-Christian tribe provinces, but the falling off in revenues estimated for the year pre-

vented the completion of these extensions, as there were not sufficient funds to pay mail transportation and the salaries of postmasters. It is believed that the appropriations and revenues for the fiscal year 1908 will be sufficient to complete these extensions.

The free-delivery letter carrier service recommended from time to time during the last six years, and which was finally authorized by the Commission in act No. 1679, for the collection and delivery of mail at each post-office in the provinces will be a means of materially improving the postal service. The Filipinos, and others except Americans, have never been accustomed to going to a post-office for their mail prior to American occupation, as the Spanish Government, like all European governments, maintained a delivery service for the delivery and collection of mail from residences. While it is true the Spanish Government maintained this service by allowing the carriers to collect, with certain exceptions, a fee on each piece of mail delivered, the people preferred to pay this fee rather than go to the post-office for their mail. It is also true that something of a free-delivery service was maintained in most municipalities under the provisions of paragraph "gg," section 39, of the municipal code, which was intended by the Commission to provide a delivery service, but it was never satisfactory. The bureau of posts had no control over it and the carriers ostensibly employed for the service were often used for other work. The mails were frequently lost or held indefinitely in the municipio. All of this resulted in a poor service and the bureau of posts received much of the blame, although it had no power to regulate it or correct evils.

For the free-delivery service in Manila 17 letter carriers are employed. During the year these carriers delivered 1,268,402 and collected 1,217,078 pieces of mail from street letter boxes.

At the commencement of the year there were 52 publications printed in the Philippines admitted to the mails at second-class rates of postage and 4 newsdealers in Manila who had the same privilege. During the year 24 new publications were admitted and 18 publications and 1 newsdealer privilege discontinued. On June 30, 1907, there were 58 publications and 3 newsdealers having second-class postage privileges, as follows:

American Book and News Company, Manila; Book Exchange, Manila; J. R. Edgar & Co., Manila.

Newspapers and periodicals.	Where published.	Language.	Frequency.
Far Eastern Review.....	Manila.....	English.....	Monthly.
Philippine Christian Advocate.....	do.....	do.....	Semi-monthly.
Philippine Military Journal.....	do.....	do.....	Do.
The Manila American.....	do.....	do.....	Daily.
The Manila Cablenews.....	do.....	do.....	Do.
The Manila Times.....	do.....	do.....	Do.
The Philippine Gossip.....	do.....	do.....	Weekly.
Philippine Education.....	do.....	do.....	Monthly.
The Philippine Journal of Science.....	do.....	do.....	10 times a year.
The Weekly American.....	do.....	do.....	Weekly.
The Monthly Sermon and Reporter.....	do.....	do.....	Monthly.
El Comercio.....	do.....	Spanish.....	Daily.
El Grito del Pueblo.....	do.....	do.....	Do.
El Libertas.....	do.....	do.....	Do.
El Mercantil.....	do.....	do.....	Do.
La Revista Filipina.....	do.....	do.....	Monthly.
La Jurisprudencia.....	do.....	do.....	Semi-monthly.
Excelsior.....	do.....	English and Spanish.	Do.
Free Press.....	do.....	do.....	Weekly.
Official Gazette.....	do.....	do.....	Do.
The Daily Bulletin.....	do.....	do.....	Daily.
Ang Kapatid ng Bayan.....	do.....	Tagalog and Spanish.	Do.
El Renacimiento.....	do.....	do.....	Do.
La Democracia.....	do.....	do.....	Do.
La Estrella de Antipolo.....	do.....	do.....	Weekly.
La Solidaridad.....	do.....	do.....	Do.
La Independencia.....	do.....	do.....	Daily.
Vida Filipina.....	do.....	do.....	Do.
Ang Bagong Araw.....	do.....	Tagalog.	Monthly.
La Igualdad.....	Bacolod.....	Spanish.....	Tri-weekly.
La Union.....	do.....	do.....	Daily.
Ang Katarungan.....	Cagayan, Misamis.....	Visayan.....	Weekly.
The Asiatic.....	Cavite.....	English.....	Do.
Ang Camatuoran.....	Cebu.....	Visayan.....	Do.
Ang Suga.....	do.....	do.....	Tri-weekly.
Silliman Truth.....	Dumaguete.....	English.....	Semi-monthly.

Newspapers and periodicals.	Where published.	Language.	Frequency.
The Infantryman.....	Fort William McKinley.....	do.....	Weekly.
El Tiempo.....	Iloilo.....	Spanish.....	Daily.
Kadapig sg Banwa.....	do.....	Visayan.....	Do.
Nuevo Herald.....	do.....	Spanish.....	Do.
Pearl of the Orient.....	do.....	English.....	Quarterly.
Ang Manugbantais.....	do.....	Visayan.....	Monthly.
Pamatan-on.....	do.....	do.....	Weekly.
El Heraldico Bicol.....	Legaspi.....	Bicol and Spanish.....	Semiweekly.
Floridel.....	Malolos.....	Tagalog and Spanish.....	Semi-monthly.
La Paz.....	Nueva Caceres.....	English and Spanish.....	Do.
El Imparcial.....	San Fernando, Pampanga.....	Pampangan and Spanish.....	Triweekly.
Daguiti Nambaga Damag.....	San Fernando, La Union.....	Ilocano.....	Weekly.
La Voz de Leyte.....	Tacloban.....	English and Spanish.....	Do.
La Voz del Pueblo.....	Tuguegarao.....	Cagayan and Spanish.....	Do.
Daan-og Apayapaan.....	Vigan.....	Ilocano.....	Semi-monthly.
La Nueva Era.....	do.....	Spanish.....	Weekly.
El Mosaiero Catolico.....	do.....	Ilocano.....	Semi-monthly.
Dalan to Cappia.....	do.....	do.....	Weekly.
La Juventud Ilocano.....	do.....	Ilocano and Spanish.....	Semi-monthly.
Philippine Christian.....	do.....	English.....	Monthly.
Inter-Island News.....	Zamboanga.....	do.....	Weekly.
Mindanao Herald.....	do.....	do.....	Do.

The several offices collected second-class postage as follows:

Office.	Fiscal year 1906.	Fiscal year 1907.
Manila.....	₱5,532.38	₱6,761.50
Bacolod, Negros Occidental.....	99.62	90.42
Bacolor, Pampanga.....	83.92	50.64
Cagayan, Misamis.....	5.96	8.38
Cavite, Cavite.....		1.44
Cebu, Cebu.....	151.22	150.82
Dumaguete, Negros Oriental.....	5.18	6.14
Fort William McKinley, Rizal.....	5.56	34.96
Iloilo, Iloilo.....	279.80	358.28
Legaspi, Albay.....		10.28
Malolos, Bulacan.....		22.20
Nueva Caceres, Ambos Camarines.....	6.20	10.88
Parang, Moro.....	.60	4.14
San Fernando, Pampanga.....		4.12
San Fernando, La Union.....	4.04	11.06
Tacloban, Leyte.....	13.06	26.62
Tuguegarao, Cagayan.....	16.08	13.28
Vigan, Ilocos Sur.....	63.72	83.42
Zamboanga, Moro.....	6.48	13.26
Total.....	6,273.82	7,661.84

An item of ₱10,000 for the purchase of post-office boxes for other post-offices was included in the estimate of expenses for the year 1907, but owing to the fact that the revenues fell considerably below the estimate no money could be expended for this purpose. A like item was included in the estimate for the year 1908, and it is hoped that before the close of the year we will be able to install boxes in a number of offices. The advisability of so doing for revenue only, to say nothing on the point of convenience to the public, is shown in the statement of box rents collected during the year.

Office.	Fiscal year 1906.	Fiscal year 1907.
Legaspi, Albay.....	₱562.66	₱529.32
Tabaco, Albay.....	148.00	315.00
Tuguegarao, Cagayan.....		75.84
Cebu, Cebu.....	1,455.40	1,504.58
Laoag, Ilocos Norte.....	107.70	90.60
Iloilo, Iloilo.....	1,891.36	1,977.35
San Fernando, La Union.....	248.00	181.00
Manila.....	11,998.70	12,164.70
Sorsogon, Sorsogon.....	251.00	254.00
Total.....	16,648.82	17,182.39

The following is a statement of the registry business for the year as compared with the year 1906:

	Fiscal year 1906.	Fiscal year 1907.	
Total number pieces mail registered at Philippine offices.	245,831	290,044	13 per cent increase.
Number pieces received from United States....	34,443	38,585	12 per cent increase.
Number pieces received from foreign countries.	52,708	54,536	3.5 per cent increase.
Number pieces sent to United States.....	39,692	46,328	17 per cent increase.
Number pieces sent to foreign countries.....	37,687	36,588	3 per cent decrease.
Number pieces sent from one Philippine office to another Philippine office.	168,452	197,128	17 per cent increase.
Number pieces handled by Manila post-office...	297,750	331,365	11 per cent increase.

The decrease in the number of pieces of registered mail sent to foreign countries is more than offset by the increase in the number sent to the United States, which may be taken as an indication that despite the rigid enforcement of the customs laws at United States ports the shipping of small parcels of merchandise to the United States and the business relations therewith are on the increase.

Shortly after the beginning of the year contracts were made by the secretary of commerce and police with commercial steamship companies to operate on regular schedules over 13 interisland routes. This service covers most of the important ports in the Philippine Islands at regular periods. The prediction made in last year's report, that knowing in advance the date on which a steamer will sail and the ports to which it will go would be of the greatest advantage, not only to the bureau of posts but to the business interests as well, has been fully realized. The service on route No. 8 has been increased voluntarily by the contractor on account of the increased business caused by running on regular schedule. The mail requirements in the contracts are sufficient to guarantee careful and prompt service. A failure to observe the mail conditions is punishable by a fine to be fixed by the interisland transportation tribunal. For the whole year only three fines were imposed on contractors for violating the mail conditions, which amounted to only ₱150.

In addition to the contract commercial steamers the bureau of navigation maintains coast-guard cutters on regular schedules over five routes, which cover points where the commercial business is not sufficient as yet to induce commercial companies to take up the service and adopt regular schedules thereon. To supplement the mail service of the contract steamers and insular government cutters, we have the army transports and other commercial vessels, all of which, taken as a whole, provide much better interisland mail communication and connections than we have had during any previous year since American occupation.

The mail launch maintained in Manila Bay for the transportation of mails to and from steamships costs about ₱10,950 per annum, but it enables the Manila post-office to close outgoing mails thirty minutes to one hour later and to deliver incoming mails from thirty minutes to two hours earlier than before it was employed.

Section 15 of act No. 1510 of the Philippine Commission, granting a concession for railway lines on the island of Luzon to the Manila Railroad Company, canceled the Spanish concession for the railroad between Manila and Dagupan. Consequently the gratuitous mail service required by the Spanish concession ceased April 24, 1907, and thereafter this service must be paid for at a rate agreed upon by the director of posts and the grantee, which for the last year was ₱85.50 per mile of road per annum for all service required, and which is the minimum rate paid for railroad service in the United States. An agreement is now under way whereby payments will be made on the amount of mail carried, to be determined by weighings not less frequent than once in four years. Two other routes, amounting to 22½ miles, or 36.6 kilometers, in length, were established from Manila to Taytay and San Mateo, Rizal Province, making five routes on lines of this company in operation June 30, 1907, of a total length of 205.12 miles, or 330.24 kilometers, on which mails were carried a total of 169,950 miles, or 273,619.5 kilometers, during the year. On account of the free service above mentioned, payment was made to the company for only 84,718.25 miles, or 136,396.38 kilometers, amounting to ₱7,623.63.

The following is a summary statement of the inland transportation of mails between post-offices for the year:

Number of contract routes between post-offices.....	31
Number of miles mails carried thereon (369,224.5 kilometers).....	229, 332
Cost for year.....	P33, 471. 30
Average cost per mile carried.....	P0. 14
Number of noncontract routes between post-offices.....	196
Number of miles mails carried thereon (830,058.04 kilometers).....	515, 564
Cost for year.....	P30, 989. 65
Average cost per mile carried.....	P0. 06
Total number of routes between post-offices.....	227
Total number of miles mails carried (1,199,282.54 kilometers).....	744, 896
Cost for year.....	P64, 460. 95
Average cost per mile carried.....	P0. 0865
Number of gratuitous routes between post-offices.....	5
Number of miles mails carried thereon (13,813.4 kilometers).....	8, 704
Number of contract routes at close of year.....	30
Length of same (1,899.8 kilometers), miles.....	1, 180
Number of noncontract routes at close of year.....	190
Length of same (4,393.6 kilometers), miles.....	2, 729
Number of gratuitous routes at close of year.....	5
Length of same (67.6 kilometers), miles.....	42
Total number of routes at close of year.....	225
Length of same (6,361 kilometers), miles.....	3, 951
Number of routes on which mails were carried during year between post-offices and mail trains or mail steamers.....	50
Cost at Manila, including mail launch.....	P18, 353. 95
Cost at other offices.....	P6, 042. 72
Total cost.....	P24, 396. 67
Number of routes in operation June 30, 1907.....	45

Notwithstanding the difficulties to be met with during the rainy season in almost every part of the islands, but very few failures to carry mails on schedule time or to make the intended connections were recorded. With the advancement in road and bridge construction now underway there should, however, be a very material improvement in the land transportation of mails, as it will permit the shortening of schedules and the delivery of mails to interior points in less time than must now be allowed.

The total cost of railroad and other inland transportation of mails shows an increase of P13,648.88 over the last fiscal year, caused by an increase in the cost of railroad service of P3,110.15, of launch hire at Manila of P7,470, of transportation in the Cagayan Valley of P1,200, of new routes in the provinces of P1,580.05, of extensions or increased frequency on old routes of P1,876.93, of the necessary increase in the cost on old routes because of inability to obtain the service at the old rates, of certain routes being in operation for the full year, and of miscellaneous items of P3,411.75. However, despite this increase in cost, we have secured sufficient additional service for the money expended to make a reduction of almost 1 centavo in the average cost per mile of mails carried.

During the year the Manila post-office dispatched 18,242 mails, consisting of 20,659 locked pouches and 24,458 bags of paper mail, to provincial post-offices. This shows an increase of 2,015 mails, 2,598 pouches, and 2,168 bags. The Manila post-office received from provincial post-offices 14,980 mails, consisting of 16,118 locked pouches and 5,777 bags of paper mail—an increase of 2,061 mails, 2,235 pouches, and 668 bags. Postal clerks on cutters maintained by the bureau of navigation distributed 3,238 packages of letters and 375 sacks of paper mail—a decrease of 4,860 packages of letters and 753 sacks of papers. These clerks handled 4,765 registered packages and 368 registered sacks—a decrease of 3,370 registered packages and 1,045 registered sacks. They traveled 62,241 miles—a decrease of 27,004 miles. The decrease in this service is explained by coast-guard cutters being replaced by commercial steamers under contract with the government which do not carry postal clerks. That the decrease in mileage is not in proportion to the decrease in the amount of mail handled is due to the fact that coast-guard cutters are now going on long runs to isolated places to and from which the amount of mail carried is not large.

The following is a concise statement of mails received from and dispatched to the United States:

Number of mails dispatched from the United States.....	104
Number of pouches of letters dispatched from the United States.....	706
Number of pouches of registers dispatched from the United States.....	2, 379
Number of sacks of papers dispatched from the United States.....	14, 576
Number of mails sent to the United States.....	67
Number of pouches of letters sent to the United States.....	687
Number of pouches of registers sent to the United States.....	964
Number of sacks of papers sent to the United States.....	1, 876

There was a sufficient number of consolidations of the several dispatches of mails from the United States while en route to the islands to reduce the number of arrivals here to 87, and consolidations en route of the 67 mails dispatched to the United States reduced the number of different arrivals at United States ports to 53.

There were sent to United States ships and troops stationed in foreign ports 875 bags of mail and 188 were received from such sources.

The following statement shows the exchanges of mails with foreign countries:

Number of mails received from foreign countries.....	588
Number of bags received from foreign countries.....	5, 324
Number of mails sent to foreign countries.....	438
Number of bags sent to foreign countries.....	2, 709
Net weight of letters sent to foreign countries, in grams.....	5, 995, 825
Increase, in grams.....	436, 326
Increase, per cent.....	7
Net weight of prints sent to foreign countries, in grams.....	16, 223, 487
Increase, in grams.....	1, 206, 139
Increase, per cent.....	7

The payments made to commercial vessels for carrying our mails to foreign ports amounted to ₱14,778.39, and to foreign countries for transportation of our mails, ₱16,859.06. The increase in the cost of railroad and other inland transportation of mails, as already shown, amounted to ₱18,648.88; but to partly offset this there were reductions in other items, so that the net increase in the cost of mail transportation of all kinds was ₱9,723.88.

The following statements show the work in the dead-letter office of this bureau for the year:

ARTICLES RECEIVED.

Source from which received.	Registered articles.	Ordinary letters.	Ordinary packages.	Total.
On hand undisposed of July 1, 1906:				
United States.....	438	6, 119	278	6, 830
Foreign countries.....	49	1, 465	240	1, 763
Manila post-office.....	841	39, 079	1, 710	41, 630
Other Philippine sources.....	34	379	9	422
Returned after attempt to find sender.....		2, 417		2, 417
Total to be accounted for.....	1, 357	49, 459	2, 246	53, 062

ARTICLES DISPOSED OF.

Disposition made.	Registered articles.	Ordinary letters.	Ordinary packages.	Total.
Returned to United States.....	212	7, 818	847	7, 877
Returned to foreign countries.....	449	2, 153	319	2, 921
Request matter, returned to senders in the Philippines.....	504	2, 921	115	3, 540
Opened and returned to senders.....		20, 787	11	20, 748
Containing money, drafts, stamps, etc., returned to senders.....		223	5	228
Containing other valuable matter.....		51	150	201
Destroyed.....	5	15, 680	1, 106	17, 041
Filed, containing money, drafts, stamps, etc.....		45	1	46
Filed, containing other valuables.....	187	81	192	460
Total accounted for.....	1, 357	49, 459	2, 246	53, 062

At the close of the year there were on file in the dead-letter office 199 registered letters and packages, 30 ordinary letters containing money, drafts, or stamps, and 568 letters and packages containing other valuables. During the year money to the amount of ₱152.22 was taken from letters which had been on file more than one year and turned into the postal revenues.

During the year 26,251 pieces of mail were advertised at the Manila post-office. Of this number only 4,296, or less than 17 per cent, were delivered, the balance being turned into the dead-letter office for disposition.

MONEY-ORDER DIVISION.

The following is a statement of the money-order business for the fiscal year as compared with the fiscal year 1906:

	Fiscal year 1906.	Fiscal year 1907.
Number orders issued.....	94,261	98,813
Amount of orders issued.....	\$8,687,126.81	\$8,229,446.09
Fees collected.....	\$16,401.44	\$19,658.59
Number orders paid and repaid.....	48,380	58,601
Amount of orders paid.....	\$1,923,206.20	\$2,211,988.95
Average amount of each order issued.....	\$89.10	\$82.69
Average amount of each order paid.....	\$39.95	\$39.45
Deposits of money-order funds received at Manila from provincial offices.....	\$1,720,735.59	\$1,787,648.55
Amount of money-order funds sent to provincial offices to pay orders.....	\$29,208.00	\$87,915.16
Amount of invalid orders deposited in insular treasury.....	\$8,479.32	\$1,255.96
Amount of Philippine orders paid in United States.....	\$2,158,450.79	\$1,292,299.02
Amount of United States orders paid in Philippines.....	\$157,308.78	\$178,542.03

From the above it will be seen that there was an increase of nearly 5 per cent in the total number of orders issued, while the total amount of all orders issued was more than 12 per cent less than for the year 1906, the decrease in the average amount of each order issued being \$8.41. The increase in the fees collected on money orders issued is caused by the new schedule of fees which went into effect May 15, 1906. The increase in the number of money orders issued is entirely in the provinces, as there was a reduction of 7,771 in the number issued at Manila.

During the year the money-order business was opened at Parang and Puerto Princesa and reestablished at Corregidor. Arrangements are now under way to extend this service to some 15 additional offices.

TELEGRAPH DIVISION.

The following is a summary of the telegraph business, including military offices operated the whole or part of the year by the signal corps:

Number of messages sent.	From mili- tary offices.	From bureau of posts offices.	Total.
Insular government business.....	30,325	38,119	68,444
Provincial government business.....	7,311	9,016	16,327
Municipal government business.....	1,279	2,514	3,793
Commercial and half-rate business.....	82,069	118,896	200,475
War Department official business.....	90,729	8,485	108,214
Navy Department official business.....	2,385	5,058	7,443
Other United States Government departments' official business.....	350	276	626
Total.....	223,408	181,854	405,322

Value of messages sent.	From military offices.	From bureau of posts offices.	Total.
Insular Government business.....	₱18,981.12	₱35,834.88	₱54,266.00
Provincial government business.....	9,900.48	10,634.58	20,585.06
Municipal government business.....	1,488.14	2,552.34	3,991.08
Commercial and half-rate business.....	62,564.66	95,363.46	157,928.12
Total telegraph revenues.....	92,834.40	149,886.86	236,720.26
War Department official business, free.....	208,022.88	14,855.70	218,478.58
Navy Department official business, free.....	3,110.48	7,088.00	10,199.06
Other United States Government departments' official business, free.....	367.22	166.80	533.52
Total of free business.....	207,100.58	22,110.60	229,211.18
Total value of all messages sent.....	290,934.98	166,996.46	465,981.44

Mileage insular telegraph lines June 30, 1907 (3,933.2 kilometers).....	2,443
Mileage insular cables June 30, 1907 (384.7 kilometers).....	239
Number miles military telegraph wires transferred to insular government during year (94.1 kilometers).....	58.50
Number miles military cables transferred to insular government during year (36.6 kilometers).....	22.79
Number miles insular telegraph wires converted into telephone during year (313.9 kilometers).....	195
Number miles insular telephone wires converted into telegraph during year (251.1 kilometers).....	156
Number miles insular telegraph lines constructed during year (222.1 kilometers).....	138
Number miles insular telegraph lines reconstructed during year (522.4 kilometers).....	324.50
Number miles insular telegraph lines abandoned and serviceable material recovered during year (64.4 kilometers).....	40
Number of insular telegraph offices closed during year.....	16
Number of insular telegraph offices opened during year.....	7
Number of military telegraph offices transferred to insular government during year.....	9
Number of insular telegraph offices June 30, 1907.....	98
Number of military offices June 30, 1907.....	61
Number of telephones in service June 30, 1907.....	411
Mileage insular telephone lines June 30, 1907 (3,790.7 kilometers).....	2,354.50
Number miles insular telephone lines constructed during year (43.4 kilometers).....	27
Number miles insular telephone lines reconstructed during year (216.5 kilometers).....	134.50
Number miles insular telephone lines abandoned and serviceable materials recovered during year (90.1 kilometers).....	53

During the three months following the close of the year all but 22 of the telegraph offices operated by the signal corps, and the lines pertaining thereto, were transferred to this bureau. Of the remaining offices 7 will subsequently be transferred when certain lines on the island of Samar are no longer required for military purposes. The 15 remaining military offices to be operated by the signal corps will all be located at military posts or on military reservations. Under the agreement reached between the Governor-General and the commanding general, Philippines Division, United States Army, the latter is to operate and maintain a cable ship for two years from October 4, 1907, for which the insular government will pay the cost of operating during the time the ship is used on cable work, and all departments and bureaus of the United States Government will have free telegraph service during the same term. All revenues collected at military offices on other telegraph business are to go to the insular government, but signal corps operators are to receive compensation for the handling of this business, you having since approved the payment to these operators of 10 per cent of the revenues of their respective offices to compensate them for the handling of commercial telegrams.

To take over these lines and offices that have been transferred to us since June 30, it was necessary to secure the discharges for some 35 soldiers of the signal corps for employment in this bureau. The operating force of the tele-

graph division is now composed of 40 American and 72 Filipino postmasters, who also perform the duties of telegraph operators, and 40 American and 23 Filipino operators; also 1 American and 53 Filipino student operators. It has been found by experience that the Filipino operator when stationed away from his home becomes more or less dissatisfied and is more likely to go wrong than if stationed in his home town. We have therefore adopted the plan of employing as students intelligent young Filipinos who have been certified by the supervising teacher as having passed through at least the fourth, and preferably the fifth grade, of the English course in the public schools, and stationing them at their homes. It is believed that in the course of six months we will be able, through these students and with those turned out by the telegraph school in Manila operated by the bureau of education, to fill nearly all vacancies in positions now occupied by American operators, so that after that time it will not often be necessary to secure American operators either from the United States or from the signal corps. These student operators employed in our offices are, as a rule, making remarkable progress in the study of telegraphy. Furthermore, many of the Filipino operators who have been employed for several years have advanced to such a degree of ability that they can now work in almost any office or on any line in the islands.

The provincial telephone service maintained by the telegraph division is much more difficult to handle than any other part of the work of this bureau. While the necessity for a central control of all means of communication by the general government is fully appreciated, I do not believe that the telephone service can ever be handled in a manner satisfactory to the users of it until it is put under local control. It is on this account that I have heretofore recommended that provincial officials of each province be given authority to construct, maintain, and operate telephone lines within their respective provinces. The administration from Manila of a provincial telephone system located at a distance is not only more difficult, but more expensive as well, than if it could be controlled locally. The fact, that the telephone service in any province is now controlled by the insular government and managed from Manila will always give greater room for complaint by the officials and people of the province than if it was directly under their own control. However, the plan which you have recently authorized, providing that the province and municipalities thereof shall reimburse the bureau of posts for all expenses for construction, maintenance, and operation of telephone lines within the province, will probably cause a material reduction in these complaints as well as in the requests for extensions of lines.

POSTAL SAVINGS BANK DIVISION.

The law providing for the establishment of postal savings banks in the Philippine Islands was enacted by the Philippine Commission May 24, 1906, but it was not until October 1, 1906, that the necessary forms required for the operation of the bank were secured. On that date the first bank was opened in the Manila post-office and subsequently extended to Cavite, Cebu, Iloilo, Zamboanga, and other offices, until at the close of the year the service had been authorized at 235 offices. Of these, 9 were of the first class, 86 of the second class, and 140 of the third class.

A summary of the transactions of these banks, by months, is given in the following tables:

Individual depositors' accounts.

Month.	Accounts opened.	Accounts closed.	Accounts standing open.	Net increase in open accounts.
1906.				
October.....	214	1	213	213
November.....	168	13	368	155
December.....	289	9	508	230
1907.				
January.....	353	28	923	325
February.....	248	38	1,133	210
March.....	270	31	1,372	239
April.....	416	75	1,713	341
May.....	455	70	2,008	385
June.....	318	87	2,329	231
Total.....	2,676	347	2,329	

Statement of deposits from October 1, 1906, to June 30, 1907.

Month.	Number.	Average.	Amount.	Interest added.	Total to depositors' credit.
1906.					
October.....	267	₱265.16	₱76,108.43		₱76,108.43
November.....	307	208.06	63,871.47	₱0.99	63,872.46
December.....	498	139.74	69,439.06	1.78	69,440.84
1907.					
January.....	830	127.97	106,090.87	8.62	106,097.99
February.....	810	105.23	85,237.45	19.23	85,256.73
March.....	882	94.16	83,052.83	40.39	83,093.22
April.....	1,156	85.81	99,208.79	98.90	99,300.69
May.....	1,317	84.50	111,278.75	112.10	111,390.85
June.....	1,180	77.85	92,081.88	3,324.46	95,406.84
Total.....	7,267	108.21	786,861.66	3,601.62	790,962.55

Statement of withdrawals, October 1, 1906, to June 30, 1907.

Month.	Number.	Average.	Amount.	Net deposits.
1906.				
October.....	25	₱49.40	₱1,235.00	₱74,868.43
November.....	96	102.02	9,998.54	53,873.92
December.....	125	106.14	13,267.78	56,173.06
1907.				
January.....	185	147.89	27,360.12	76,737.87
February.....	188	128.15	25,972.70	59,284.08
March.....	268	165.11	44,250.14	38,843.08
April.....	313	166.50	52,117.11	47,183.58
May.....	372	129.33	48,112.45	63,278.40
June.....	396	146.94	58,185.37	37,220.97
Total.....	1,968	148.25	280,490.21	509,463.34

Of the above withdrawals, 103 were made by telegraph at an average cost to the depositor of ₱1.14 for each withdrawal.

Classification of depositors as to nationality.

Nationality.	Number of depositors.	Per cent of total.
Americans.....	1,616	60.4
Filipinos.....	944	35.3
Europeans.....	60	2.2
Asiatics.....	45	1.6
Societies.....	11	.5
Total.....	2,676	100

Classification of depositors as to occupation.

Occupation.	Number of depositors.	Per cent of total.
Professional.....	346	12.9
Clerical.....	408	15.3
Student class.....	95	3.6
Agricultural.....	50	1.8
Mercantile.....	56	2.1
Soldiers and sailors.....	496	18.5
Police men.....	53	2.0
Artisans.....	367	13.7
Domestics.....	54	2.0
Laborers.....	376	14.1
Children.....	175	6.5
Women, no occupation.....	132	5.0
Miscellaneous and unclassified.....	57	2.2
Societies.....	11	.3
Total.....	2,676	100.0

The classification "professional" includes, in addition to those usually so classified, those employees of the government whose duties are such as to throw them into this class rather than into the "clerical" class and also a large number of Filipino teachers who can not well be classed under any other head. The "student class" includes all students over the age of 15, those under this age being classified as "children." Under "soldiers and sailors" are included all officers and enlisted men of the army and navy, marines, and the constabulary.

Classification of depositors, miscellaneous.

Classification.	Number of depositors.	Per cent of total.
Married.....	782	29.2
Male.....	2,354	87.9
Female.....	310	11.5

The following is a classification of depositors' balances without regard to nationality:

Amount (in pesos).	Number of ac- counts.	Increase in num- ber.	Average accounts.	Amount of bal- ance.
		<i>Per cent.</i>		
Under 50.....	1,156	15.5	P11.98	P11,941.61
51 to 100.....	240	6.6	71.01	17,043.72
101 to 300.....	372	19.2	167.25	62,217.70
301 to 500.....	169	15	376.36	63,606.11
501 to 1,000.....	208	2.4	694.65	144,487.83
1,001 to 5,000.....	133	52.3	1,462.32	194,489.70
5,001 and over.....	2	50	7,838.33	15,676.67
Total.....	*2,279	14.8	223.54	509,463.34

* Fifty accounts remain open with no credit balances.

The following is a classification of depositors' balances according to nationality:

Amount (in pesos).	Accounts of Ameri- cans.		Accounts of Fili- pinos.		Accounts of Euro- peans.		Accounts of Asi- atics.	
	Num- ber.	Amount.	Num- ber.	Amount.	Num- ber.	Amount.	Num- ber.	Amount.
Under 50.....	410	P5,701.60	722	P5,890.59	14	P179.02	9	P180.40
51 to 100.....	161	11,801.80	74	4,890.05	3	191.50	2	160.37
101 to 300.....	300	51,343.65	40	6,062.20	17	2,547.56	15	2,264.29
301 to 500.....	142	53,356.38	19	7,330.31	2	775.02	6	2,143.80
501 to 1,000.....	182	126,655.30	17	11,509.42	6	3,904.36	3	2,418.76
1,001 to 5,000.....	122	176,865.56	8	10,524.83	3	7,069.31		
5,001 and over.....	2	15,676.67						
Total.....	1,319	441,400.96	880	46,197.40	45	14,697.37	35	7,167.61

Section 9 of the bank act provides for the issue and sale of postal savings bank stamps in the denominations of 5, 10, and 20 centavos, respectively, which shall be for sale at every postal savings bank. These stamps were ordered in July, 1906, and received in the following February. The 5-centavo stamp bears a large figure 5 in the center surrounded by tropical palms and cocoanut trees, and the color is sepia. The 10-centavo stamp portrays the Parian gate of the old walled city of Manila, and the color is carmine. The 20-centavo stamp portrays a Philippine rice paddy during the planting season, with mountains in the background, and the color is light green. The plates for these stamps cost P2,064.30. The cost for the manufacture of the 5-centavo stamps, exclusive of plates, is P0.2414 per thousand; for the 10-centavo, P0.6436 per thousand, and for the 20-centavo, P1.0236 per thousand. As these stamps are designed especially for the use of the school children and were available only a few days before the close of the school year, the sales were rather small. The total

sales to June 30 at Manila amounted to ₱283.90, and at other offices ₱1,592.40. Of these, stamps to the value of ₱1,219 were deposited on interest-bearing accounts, thus leaving outstanding stamps June 30, subject to redemption, amounting to ₱637.30.

The expenses of the bank were as follows:

Salaries of chief of postal savings bank division, clerks in the office of the director of posts, postmasters, and clerks in post-offices	₱15,660.00
Printing and binding special forms	11,910.99
Other supplies, including stationery and furniture and repairs to same; proportional part of rent of offices, cablegrams, and traveling expenses of district inspectors	2,159.50
Postal savings bank stamps	4,061.34
Interest paid to depositors	3,601.52
Total	37,393.35

As a credit to this expense we have the sum of ₱6,495.36 for interest earned on the investments of the bank funds, but not due to be paid until after the close of the year. The expense for the supplies for the bank was materially larger than it will be during the next year, and at the close of the fiscal year the supplies on hand and not in use amounted to approximately ₱10,000.

The investment of the funds of the postal savings bank is, by the provisions of section No. 18 of act No. 1493, placed in the hands of an investment board composed of the secretary of commerce and police, the secretary of finance and justice, the director of posts, the insular treasurer, and a business man, appointed by the Governor-General. Shortly after the first bank was opened in Manila the Governor-General appointed Mr. Barry Baldwin, of Manila, to fill this position.

The investment of the funds of the bank was at that time by law limited to bonds or other evidence of indebtedness of the United States; bonds or other evidence of indebtedness of the insular government, of the city of Manila, or of any municipality, issued in pursuance of the act of Congress; interest-bearing deposits under proper security in any bank situated in the United States or in the islands having an unincumbered paid-up capital equivalent to ₱1,500,000, and stocks or shares of banks doing business in the Philippine Islands having a paid-up capital of ₱1,500,000. At the time the first funds of the bank were available for investment there appeared to be no bonds or other evidences of indebtedness of the United States or of the Philippine Islands nor stocks or shares of banks doing business in the islands that could be purchased at a rate making their investment profitable to the bank; therefore, as a temporary measure and until better means of investment could be found, it was decided by the board to place the funds of the Bank in interest-bearing deposits in the banks of Manila meeting the requirements of the law. The following is a table of the funds so invested in each bank during the year, all of which bear interest at the rate of 3½ per cent per annum:

Bank.	Amount.
International Banking Corporation	₱170,000.00
Hongkong and Shanghai Banking Corporation	120,000.00
Chartered Bank of India, Australia, and China	180,000.00
Banco Español-Filipino	70,000.00
Total	490,000.00

All of the above banks meet the requirements of the law and the deposits in them are protected by surety bonds filed with the Bureau of Insular Affairs.

This section of the bank law was amended March 22, 1907, by act No. 1620, so as to authorize the investment of the funds of the bank in first mortgages or deeds of trust to the bank of improved and unincumbered city real estate, with registered title, situated in the cities of Manila, Iloilo, Cebu, and Zamboanga, and upon first mortgages or deeds of trust to the bank of actually cultivated improved and unincumbered agricultural land in the provinces with title registered in accordance with the land registration act. However, no investments under this amendment were made up to the close of the year, but advantage of this authority has since been taken by the board. These

provisions, widening the field of investment of funds of the bank, will enable the institution to reach a self-supporting basis much sooner than the original provisions of the law would have allowed.

The foregoing tabulated statements show that about 58 per cent of the depositors with credit balances June 30 were Americans and 39 per cent Filipinos, and that these American depositors held 86.6 per cent of the deposits, while the Filipino depositors held only 9 per cent. This is accounted for by the fact that during the first few months the bank gathered in the larger part of the surplus savings of the depositors, who were at that time mostly Americans. The deposits of the later months represent more nearly the current savings of the depositors, and the figures show an increasing number of Filipino depositors. Up to June 30, 944 accounts, representing 35.3 per cent of the total, had been opened by Filipinos, but in the succeeding three and one-half months 923 additional Filipinos became depositors. The success of the bank must depend entirely upon the interest taken in it by the Filipino people. The fact that in the last three and one-half months nearly as many accounts were opened by Filipinos as during the preceding nine months is, I think, very satisfactory evidence that the Filipinos are likely within a few years to make a very large use of the banks. On the other hand, it is very probable that for some years to come the savings bank will be little more than a temporary depository of the small savings of the common people, as the wants and daily requirements of this class are likely to grow faster than their incomes. Doubtless the most valuable means of furthering the use of the savings bank is the cooperation of the schools, which has been cordially extended. The director of the bureau of education, as well as all officials and teachers, have taken a great interest in the work and assisted in every possible way to bring the bank to the attention of the school children. In addition to this, steps have already been taken for the insertion of a large amount of illustrated material in a series of arithmetics now being published for the use of the schools. The prizes which you have offered to school children are yielding very gratifying results and are doubtless responsible to a great extent for the rapid increase in the number of Filipino depositors. It is probable that something of this kind might be made a permanent feature of the work of the bank. The benefits to be derived would be ample compensation for the insignificant expense involved.

In order to give the bank publicity the rules and regulations have been printed in pamphlet form in both English and Spanish and distributed liberally from every post-office and through the schools. In addition to this a folder has been printed in English, Spanish, Tagalog, Pampangan, Pangasinan, Ilocano, Ibanag, Bicol (Ambos Camarines), Bicol (Albay), Visayan (Cebu), Visayan (Negros), Chinese, and Japanese, calling special attention to the value of saving. It is also our intention to have the rules and regulations of the bank printed in at least some of these dialects. The question of securing the services of several thoroughly competent Filipinos, well versed in the native dialects, to go from place to place for the purpose of explaining to the common people the nature of the postal savings banks and encouraging their use is also under consideration. In fact, it appears quite necessary that something of this kind be done to dispel the opposition to the banks that now exists in some parts. We have received frequent reports from our postmasters that the common people of the Philippines have been informed in some way that in view of the possibility of war between the United States and Japan they should not deposit their money with the government, as it would probably be lost. In other parts the people have been so imbued with the idea of early independence that they object to putting their money in the hands of the government to have it returned to them when independence is secured. It is probable that all this is the work of political demagogues, but nevertheless to overcome it will no doubt require the services of prominent Filipinos in whom the people have the fullest confidence.

On the whole, the progress made by the bank during its first year is, I think, very satisfactory and has more than come up to the expectations of the government. The total amount of interest paid to depositors was ₱3,601.52, of which ₱3,147.14 was added to depositors' balances June 30, in accordance with the provisions of section No. 10, paragraph (c), of the bank act, and the balance was paid during the year to depositors who closed their accounts. The net deposits have increased in round numbers from ₱509,000 June 30 to ₱690,000 this date.

Under the law, banks of the third class may receive deposits only by means of postal savings bank stamps, and no single deposit may be received at a bank of this class in excess of ₱25, nor may one account be credited with more than

two deposits in the same month. It is believed that the restrictions limiting deposits in banks of this class to stamps only should be removed and that such banks should be authorized to receive deposits in money as well as stamps. Limiting these banks to the acceptance of stamps only makes an unnecessary expense for the manufacture of stamps and causes much extra work in the handling of the stamped cards. It is also believed that a change in the law should soon be made permitting postmasters in the provinces to pay withdrawals of small amounts, say not exceeding ₱10, to depositors without first obtaining authority from the central office. Some of the European countries operating postal savings banks have recently adopted this provision. By this means it enables a provincial depositor to withdraw funds in case of an emergency without the long delay necessary to get authority from Manila or the expense for telegraphic authority. It appears advisable, however, not to make recommendations too soon for changes in the law as first enacted, and therefore as yet no specific recommendation for these changes has been submitted.

CONCLUSION.

During the year 73 cases, including incomplete investigations carried over from the year before and involving embezzlement of postal or money-order funds, theft of valuable contents from mail matter, registered and ordinary, alleged losses of mail, raising of money orders, two fake robberies of post-offices, etc., were investigated. As a result, 12 postmasters and other employees were convicted on the charge of infidelity in the custody of documents for robbing the mails, and there remain two cases on the same charge which have not been tried; 4 convictions of postmasters for embezzlement of public funds were secured; 3 postmasters and one clerk were required to pay the value of the contents of mail lost or stolen through their carelessness; 3 persons not in the employ of this bureau were convicted of raising money orders; 2 for theft of mail, and 1 was required to pay the value of a registered parcel for accepting delivery when he knew it was not intended for him; 1 lineman was convicted for writing obscene matter on the outside of an envelope of a letter addressed to another; and 4 employees were dismissed from the service for theft of mail or gross carelessness in handling the same, causing loss, without attempt to convict in court on account of insufficient evidence.

Two years ago the Commission was disposed to abolish the inspectors employed in this bureau and have this work done by district auditors. I think the number of cases above cited, all of which, with the exception of three, required a full knowledge of postal work, demonstrates beyond question the necessity for the employment of inspectors in this bureau who have a thorough knowledge of all branches of the work.

Although but eighteen months have elapsed since the beginning of the combination of the telegraph service of the islands with the postal service was made, it can be said beyond any question of doubt that such a combination can be worked satisfactorily and economically. By this combination, and also with the postal savings bank subsequently established, we are able to effect larger economies by securing more labor from each employee and at the same time give him better pay for his services. Telegraph operators are, as a rule, keen to learn postal work in order to secure these advantages, and many postal employees are for the same reasons making a zealous study of telegraphy. There can be no question about the scheme being successful, and in a short time we will be able to demonstrate this fact to the home Government.

Respectfully submitted.

C. M. COTTERMAN,
Director of Posts.

The SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

REPORT OF CHIEF POSTAL SAVINGS BANK DIVISION.

OFFICE OF THE DIRECTOR OF POSTS,
Manila, P. I., September 3, 1907.

SIR: In accordance with the provisions of section No. 2 of act No. 1493, United States Philippine Commission, I have the honor to submit herewith my annual report covering the operations of the postal savings bank division for the fiscal year ended June 30, 1907.

The law providing for the establishment of postal savings banks in the Philippine Islands was enacted by the United States Philippine Commission May 24, 1906, and the writer was appointed chief of the postal savings bank division on July 11 of the same year. The necessary forms having been prepared, the Manila office was opened for the transaction of business October 1, 1906. Other offices were subsequently established as conditions seemed to warrant, until at the close of the fiscal year, June 30, there were 235 offices open for the transaction of business. Of these offices 9 were of the first class, 86 of the second class, and 140 of the third class. Business was transacted in 125 of these offices as shown in Exhibit A, referred to later.

STATEMENT OF RESOURCES AND LIABILITIES.

The following is a statement of the resources and liabilities of the postal savings bank as they appeared at the close of business, June 30, 1907:

Resources.		Liabilities.	
Deposits with Hongkong and Shanghai Bank.....	₱120,000.00	Individual depositors' balances.....	* ₱509,463.34
Deposits with Chartered Bank.....	130,000.00	Stamps outstanding.....	637.30
Deposits with International Bank.....	170,000.00		
Deposits with Banco Español-Filipino.....	70,000.00		
In hands of insular treasurer.....	5,000.00		
In hands of cashier, Manila post-office.....	7,261.66		
In hands of outside postmasters.....	7,838.98		
Total.....	510,100.64	Total.....	510,100.64

* The sum of ₱3,147.14 interest was added to depositors' accounts June 30, in accordance with the provisions of section 10 (c) of act No. 1493, and the sum of ₱177.32 paid on closed accounts in June, which, with interest paid in previous months, ₱454.38, makes a total of ₱3,601.52 for the year.

The balance sheet at the end of the fiscal year appears as follows:

Balance sheet, June 30, 1907.

Account.	Debit.	Credit.
Postmasters' stamp account.....	₱364,068.10	
Cash in hands of postmasters.....	15,100.64	
Deposited with insular treasurer.....	5,000.00	
Time deposits with—		
Chartered Bank of India, Australia, and China.....	180,000.00	
International Banking Corporation.....	170,000.00	
Hongkong and Shanghai Banking Corporation.....	120,000.00	
Banco Español-Filipino.....	70,000.00	
Loss and gain.....	* 37,898.35	
Stamp stock.....		₱364,068.10
Stamp sales and deposit account (representing undeposited stamps).....		637.30
Individual depositors' balances.....		509,463.34
Bureau of posts appropriation.....		37,398.35
Total.....	911,562.09	911,562.09

* Against this item, representing the total expenses of the postal savings bank for the fiscal year, including interest, may be set the sum of ₱6,495.38 interest accrued, but not paid, on time deposits with the various banks.

BUSINESS TRANSACTED.

A statement of the operations of the various banks for the fiscal year is presented in the table appended to this report as Exhibit A.

A summary of the transactions by months is given in the following table.*

* This table has been omitted, as it is included in report of the director of posts.

At the present writing, September 3, the records show that deposits have been received to an amount slightly in excess of ₱1,000,000, and that of this amount approximately ₱600,000 remain on deposit.^a

TELEGRAPHIC WITHDRAWALS.

During the fiscal year 103 telegraphic withdrawals were made at an average cost to the depositor of about ₱1.14 for each withdrawal. These withdrawals represent 5 per cent of the total number made. The amount so withdrawn was ₱10,678.39, or 3.8 per cent of the total.

POSTAL SAVINGS BANK STAMPS.

During the months of February and March, 1907, there were received from the Bureau of Printing and Engraving, Washington, D. C., the following amounts of postal savings bank stamps:

Denomination.	Amount.	Value.
Twenty-centavo stamps.....	507,540	₱101,508.00
Ten-centavo stamps.....	1,048,082	104,808.20
Five-centavo stamps.....	3,192,064	159,603.20
Total.....	4,747,686	365,914.40

These stamps are designed more especially for the use of the school children, and the fact that they were available only a few days before the close of the school year, April, accounts for the small number of stamps sold during the fiscal year.

A statement of the stamp transactions is given in the following table:

Statement of postal savings bank stamp transactions.

Month.	Sold.			Deposited.	Undeposited.
	Manila.	Provinces.	Total.		
1907.					
March.....	₱152.90		₱152.90	₱48.00	₱104.90
April.....	60.65	₱283.25	343.90	132.00	316.80
May.....	31.45	628.35	659.80	445.00	531.60
June.....	18.90	680.80	699.70	504.00	637.30
Total.....	263.90	1,592.40	1,856.30	1,219.00	637.30

CLASSIFICATION OF DEPOSITORS.

In order to arrive at a more accurate knowledge of the classes of people making use of the postal savings bank and of the business transacted by them, the following classification of depositors and their balances at the close of the fiscal year has been made.^b

In connection with the above classification of depositors as to occupation it should be noted that the "professional" class includes, in addition to those usually so classified, those employees of the government whose duties are such as to throw them into this rather than into the "clerical" class. There are also included in this class a large number of Filipino teachers, who by virtue of their preparation would not properly be so classified, but who can not well be classed under any other head. The "student" class includes all students over the age of 15, those under this age being classified as children. Under

^a A table showing deposits and withdrawals has been omitted, as it is also included in the report of the director of posts.

^b Tables showing nationality, occupation, and conjugal condition of depositors have been omitted, as they appear in the report of the director of posts.

"soldiers and sailors" are included all officers and enlisted men of the army, navy, and constabulary.

CLASSIFICATION OF DEPOSITORS' BALANCES.

In the following tables is given a classification of the depositors' balances. The first table represents a general classification without regard to nationality, while the second gives a classification according to nationality.^a

INVESTMENT OF POSTAL SAVINGS BANK FUNDS.

The investment of the funds of the postal savings banks is, by the provisions of section No. 18 of act No. 1493, placed in the hands of an investment board, composed at present of the secretary of commerce and police, the secretary of finance and justice, the director of posts, the insular treasurer, and Mr. Barry Baldwin, a business man of Manila. On the recommendation of this board the following investment of postal savings bank funds in the form of time deposits bearing 3½ per cent interest had been made at the end of the fiscal year:

Bank.	Amount.
International Banking Corporation.....	P 170,000.00
Hongkong and Shanghai Banking Corporation.....	120,000.00
Chartered Bank of India, Australia, and China.....	180,000.00
Banco Español-Filipino.....	70,000.00
Total.....	490,000.00

All of the above banks are duly authorized depositaries of the Philippine government, and the deposits in them are amply protected by surety bonds filed with the Treasurer of the United States.

At the close of the fiscal year interest had accrued on the above deposits in the sum of P6,495.36, being in excess of the amount of interest paid to depositors by P2,893.84.

In order to provide a more lucrative field of investment for the funds of the bank, act No. 1493 was amended March 22, 1907, by act No. 1620. Under the provisions of this amendment loans may be made upon city real estate, under carefully guarded provisions, to the extent of 25 per cent of the total deposits of the bank, and upon improved agricultural land to the extent of 10 per cent of the total deposits. Provision was also made for investments in and loans upon any securities the principal or interest of which is guaranteed by the Government of the United States or of the Philippine Islands. On May 3 further provision was made by act No. 1640 for the loaning of the bank funds to the various provinces for public improvements under the guaranty of the insular government. Under the provisions of this act the province of Pangasinan has applied for a loan of P160,000 for six years, with interest at the rate of 5 per cent.

These provisions, widening the field of investment of postal savings bank funds, will enable the institution to reach a self-supporting basis much sooner than the original provisions would have allowed and at the same time will give ample protection to the bank.

GENERAL.

The statements contained in the foregoing pages concerning the operations of the postal savings bank for the fiscal year are so complete in their details as to require little in the way of explanation. There are, however, several points that seem to deserve special comment.

^a These tables have been omitted and are on file in the Bureau of Insular Affairs, War Department.

GENERAL EXPENSES.

The total expenses of the bank for the fiscal year as given in the balance sheet under the item of loss and gain, page 416, are ₱37,398.35. If from this amount there be deducted the sum of ₱6,495.36, representing interest earned on the investment of the bank's funds, there remains the sum of ₱30,897.99, representing the real deficit for the fiscal year. A considerable part of this deficit is, however, more nominal than real, for, excluding from consideration that part of the supplies in the hands of postmasters which will not have to be duplicated for several years, there were on hand in the division of supplies, June 30, supplies to the estimated value of ₱10,000.

INDIVIDUAL DEPOSITORS' ACCOUNTS.

The classification of depositors' balances given on page 411 reveals the fact that about 58 per cent of the depositors with credit balances are Americans and 39 per cent Filipinos. It also appears that the 58 per cent American depositors held 86.6 per cent of the deposits, while the 39 per cent Filipino depositors held only 9 per cent. Herein lies the explanation of the unusually large size of the average deposit, ₱108.21, and average withdrawal, ₱143.25, shown in the table on page 411. In this connection it should be noted that the average size of the deposits fell, during the period under consideration, from ₱265.16, the average for October, 1906, to ₱77.85, the average for June, 1907. This is accounted for by the fact that the bank, during the first few months, gathered in the larger part of the surplus savings of the depositors, who were at that time very largely Americans. The deposits of the latter months represent more nearly the current savings of the depositors, among whom was an increasing number of Filipino depositors.

The large size of the average withdrawal, ₱143.25, is due to the fact that a large number of Americans deposit their savings in the bank only to draw them out in a lump sum on their return to the United States.

To the Americans scattered throughout the islands the bank has proved to be a great blessing, and while it is probable that about one in ten of the Americans in the islands are depositors, there is much to be desired in the extension of the work among our own people, who are, as a class, notably improvident.

The success of the postal savings bank, however, must ever be measured by the interest taken in it by the Filipino people. The records show that up to June 30, 944 accounts, representing 35.3 per cent of the total, had been opened by Filipinos. This is not a large number, but considering the fact that only a very small percentage of the Filipino people, and those mostly located in three large cities, have any conception whatever of the nature of a bank, and considering further the fact that it is exceedingly difficult to make such an institution known, much less understood, and that the cooperation of the schools in this matter is only at the present writing, September 3, beginning to be effective, it is believed that this represents a fairly good showing for six months' work, only a few banks having been opened before January 1, 1907.

EXTENSION OF THE BANK'S BUSINESS.

Under this head I desire to call attention to several means of furthering the use of the bank, especially by the Filipino people. The extent to which they will make use of the bank will, of course, be determined largely by the conditions under which they live as well as by the success attained in dispelling prejudice, overcoming custom, and making the institution known. To the great body of the people the government is at best but a hazy abstraction, the occasional concrete manifestation of which is more apt to inspire fear than confidence because of its restraining influence. It is no more than can be expected, under the circumstances, that the body of the people should look with suspicion upon the motives of the government in asking them to deposit their savings with its officials. It will take much time and patience to dispel this suspicion, and our hope of success rests largely upon what can be accomplished with the rising generation.

The conditions under which the Filipino people live must also be given careful consideration. For many years to come they will need to expend the larger part of their income in raising their standard of living. The pathway of civilization is paved with an ever increasing number of wants, and the implanting of new and higher ideals is a fundamental factor in the progress of any people.

Nothing less will ever stir them out of their lethargy of primitive content. The schools and churches will ever be the most important factors in implanting new ideals. However, they are not alone in that work. The merchant who, by the tactful display of his goods, can cause new wants to arise is, as well, a powerful factor in stimulating that healthy discontent with present surroundings which will loosen the springs of effort, and while the prime motive behind commerce is financial gain, due credit should be given for the part it plays in carrying these concrete embodiments of civilization to the very doors of the humblest inhabitant of the globe, thereby awakening in him new desires and aspirations.

In view of these circumstances the line of action seems to be clearly marked out. Outside of the few favored ones who are blessed with a fixed purpose and endowed with sufficient energy to struggle for the attainment of the same, and who may be left out of consideration, the lesson to be taught by the savings bank is a proper discrimination in the valuation of the various commodities that enter into the daily life of the individual. The lower the scale of development, the more pressing are the wants of the moment. So true is this that the satisfaction of wants can at best be postponed for a short time. The stage of preparation for the "rainy day" or old age is still a long way off. Inasmuch as it is almost inevitable that there will remain no margin of income over expenditures, and it is well that it is so at this stage, attention should be directed to the necessity of turning expenditures from useless and unessential channels to those best calculated to contribute to permanent welfare, as, for instance, the curtailment of expenditures for sweetmeats and fancy articles of dress, with a view of purchasing, in the near future, something contributing to the upbuilding of the home. A man's expenditures will thus be gaged by a proper discrimination in values and come to be an expression of his noble rather than ignoble desires.

Under these conditions the savings bank for many years can hope to be but little more than a temporary depository of the small savings of the common people, and its work will be classified very largely as educational. It is evident, therefore, that the most valuable means of furthering the use of the savings bank is the cooperation of the schools, which has been most cordially extended. For the economy of effort and the attainment of larger results, it is believed that this cooperation should be placed upon a more concrete and tangible basis. Steps have already been taken in this direction by the insertion of a large amount of illustrative material in a series of arithmetics now being published for the use of the schools. This should be extended as far as the nature of the work will allow to other text-books, in order that the teacher may have no excuse for neglecting this most important part of the child's education, as well as in order that, coming under the guise of illustrative material, it may not be considered as an additional burden. The work of teaching the child habits of thrift and foresight can be thus so woven into the work of the school that no pupil will leave its doors without having a full knowledge of the postal savings bank and a desire to make use of its privileges. The prizes offered to school children by the honorable commissioner of commerce and police are at the present writing yielding gratifying results in this direction, and I should like to see something of this kind made a permanent feature of the work. It is therefore recommended that an annual competition be provided for among the children of both public and private schools as follows. (1) That there be awarded to the pupil of each school division writing the best essay on "Thrift and foresight" an artistically designed certificate of merit bearing the great seal of the Philippine Islands and the signature of the governor-general and the secretary of commerce and police. (2) That a scholarship for one year in the Manila Trade School be awarded to such one of the above successful pupils being a boy as shall have been adjudged to have written the best essay on this subject, or a scholarship in the Manila Normal School under the same conditions if the successful pupil be a girl.

The benefits to be derived from the provisions of this contest, it is believed, would be ample compensation for the insignificant expense involved.

General publicity is another valuable manner of furthering the work of the postal savings bank. A beginning has been made in this respect by the publication in English and Spanish, for free distribution, of the rules and regulations of the bank in pamphlet form. A folder has also been printed in the most important dialects of the islands calling special attention to the value of prep-

aration for the uncertainties of the future. In this connection the suggestion is made that it might be found desirable to secure the services of several thoroughly competent Filipinos, well versed in the native dialects, to go from place to place for the purpose of explaining to the common people the nature of the postal savings banks and encouraging their use. In this way a very large class of people could be reached whom it would be difficult, if not impossible, to reach in any other way.

In conclusion I desire to call attention to the desirability of providing a simple method by which employees of the government may allot any desired portion of their salary, either monthly or annually, to be deposited in the postal savings bank through the proper disbursing officer. It is believed that such a plan can be worked out so as to involve little extra work upon the disbursing officer. Such a provision has been recently introduced into the postal savings bank system in India with very satisfactory results. There is a question, however, as to whether this can be done without some legislation for the protection of the disbursing officer in the matter of the making of an allotment of salary by a government employee.

All of which is respectfully submitted.

BEN F. WRIGHT,
Chief Postal Savings Bank Division.

The SECRETARY OF COMMERCE AND POLICE.
(Through the Director of Posts.)

EXHIBIT A.

Statement of postal savings bank business transacted according to offices during fiscal year 1906-7.

Office.	Class of bank.	Number of accounts opened.	Number of accounts closed.	Number of accounts open.	Number of withdrawals.	Average with-drawal.	Amount of with-drawals paid.	Number of deposits received.	Average size of deposits.	Amount of deposits received.	Stamp sales.
						Pesos.	Pesos.		Pesos.	Pesos.	Pesos.
	3	1		1				2	2.00	4.00	6.00
	2	4		4				6	3.18	19.00	35
	2	4		8				32	23.61	755.70	3.65
	2	16	1	15		50.00	50.00	27	32.55	878.94	1.75
	3	6		6		68.54	137.09	7	7.00	49.00	49.70
	2	3		3				4	50.75	203.00	
	3	16	2	14		3.01	3.01	29	27.75	805.00	
	3	1		1				1	6.00	6.00	6.00
	3	18	3	15		115.33	576.67	40	60.67	2,427.00	70
	3	5		5				10	7.40	74.00	76.05
	3	3		3				10	55.10	551.00	5.25
	3	3		3				8	35.00	105.00	
	2	3		3				3	1.00	3.00	30
	2	61	9	52		90.14	1,586.37	142	31.46	4,468.00	54.06
	3	9		9				18	1.92	182.00	25.53
	3	1		1		70.54	70.54	1	1.00	1.00	85
	2	4		4				5	1.40	7.00	1.90
	2	2		2				6	87.50	525.00	
	3					30.00	30.00				
	3	5	1	4				12	19.51	237.75	
	3	10		10		3.00	3.00	31	1.42	44.00	2.00
	3							3	16.46	60.00	51.45
	3										75.40
	3	5	1	4		10.00	10.00	5	124.50	624.00	
	2	14	4	10		400.42	400.42	71	54.87	3,886.00	33.45
	2	6	1	5		214.99	2,149.98	28	81.64	2,298.00	1.15
	2	6	4	2				9	7.44	67.00	67.00
	3	5		5				40	60.25	2,410.00	
	3	18	1	17		145.83	436.00	2	2.00	2.00	1.55
	2	2		2				3	6.66	20.00	20.00
	3	7		7				7	1.00	7.00	3.20
	3	1		1				1	8.00	8.00	
	3	8	1	7		80.00	80.00	20	67.75	1,355.00	
	2	3		3				3	86.66	260.00	
	2	88	20	68		104.76	3,142.87	292	600.41	15,731.00	
	1	53	5	48		35.62	856.07	112	50.78	5,667.00	
	3	6		6				10	4.30	43.00	43.00
	3	11		11				01	25.80	1,573.70	

[illegible]

Statement of postal savings bank business transacted according to offices during fiscal year 1960-7—Continued.

Office.	Class of bank.	Number of accounts opened.	Number of accounts closed.	Number of accounts open.	Number of withdrawals.	Average of withdrawals.	Amount of withdrawals paid.	Number of deposits received.	Average of size of deposit.	Amount of deposits received.	Stamp rates.
Ormoc, Leyte.	1	7	2	5	4	137.50	550.00	24	10.39	2,194.00	1.50
Oroquieta, Misamis.	1	1	1	1	1	10.00	10.00	1	60.00	60.00	1.00
Pagsanjan, Laguna.	1	1	1	1	1	1.00	1.00	1	81.75	1,035.00	1.00
Palo, Leyte.	1	1	1	1	1	1.00	1.00	1	81.75	1,035.00	1.00
Parang, Moro.	1	8	2	6	6	1.00	1.00	20	81.75	1,035.00	1.00
Pasacao, Ambos Camarines.	1	9	1	8	9	25.00	25.00	15	1.00	24.00	20.15
Peñaranda, Nueva Ecija.	1	1	1	1	1	2.00	2.00	1	10.00	10.00	10.30
Pontevedra, Negros Occidental.	1	8	1	7	1	1.12	1.12	8	1.12	9.00	10.30
Quingua, Bulacan.	1	1	1	1	1	1.00	1.00	6	100.00	600.00	5.00
Romblon, Capiz.	1	6	1	5	1	30.00	30.00	20	2.75	55.00	5.00
San Carlos, Pangasinan.	1	1	1	1	1	30.00	30.00	9	7.88	71.00	76.00
San Fernando, Union.	1	31	3	28	6	51.66	310.00	113	61.46	7,285.00	4.00
San Fernando, Pampanga.	1	9	1	8	1	201.25	201.25	17	32.46	551.90	5.70
San Isidro, Nueva Ecija.	1	5	2	3	1	1.00	1.00	10	32.96	329.64	1.00
San Jose, Ambos Camarines.	1	2	1	1	2	1.00	1.00	2	1.00	2.00	1.00
San Jose, Antique.	1	11	1	10	3	81.06	245.00	40	78.93	3,157.30	9.00
San Miguel, Bulacan.	1	3	1	2	3	1.00	1.00	3	3.00	9.00	9.00
San Narciso, Zambales.	1	11	1	10	1	1.00	1.00	1	20.00	20.00	20.00
San Pablo, Laguna.	1	6	2	4	1	75.00	75.00	18	8.23	42.00	42.00
Santa Cruz, Laguna.	1	2	2	0	1	2.00	2.00	12	57.70	692.40	2.95
Shay, Negros Occidental.	1	23	2	21	2	358.98	717.96	67	1.00	6.00	2.60
Sorsogon, Sorsogon.	1	2	2	0	2	1.00	1.00	2	40.18	2,692.00	14.50
Sual, Pangasinan.	1	2	2	0	2	1.00	1.00	2	1.50	3.00	3.00
Surigao, Surigao.	1	4	1	3	1	10.05	10.05	7	5.00	35.00	5.00
Tacloban, Leyte.	1	47	6	41	12	73.61	888.37	209	68.37	14,290.00	5.90
Tagbilaran, Bohol.	1	22	2	20	1	200.00	200.00	52	71.00	3,692.00	7.15
Tanauan, Leyte.	1	5	1	4	1	1.00	1.00	7	1.00	7.00	7.00
Tarlac, Tarlac.	1	1	1	0	1	1.00	1.00	4	57.50	230.00	1.40
Tubigon, Bohol.	1	1	1	0	1	40.00	40.00	28	64.68	1,811.00	1.00
Tuguegarao, Cagayan.	1	9	1	8	1	1.00	1.00	1	1.00	1.00	1.00
Valencia, Bohol.	1	17	4	13	4	187.79	751.19	85	68.95	5,861.00	1.10
Vigan, Ilocos Sur.	1	2	2	0	2	1.00	1.00	2	62.50	125.00	1.00
Virac, Albay.	1	34	7	27	16	129.92	2,086.83	83	180.01	12,094.00	1.40
Zamboanga, Moro.	1	1	1	0	1	1.00	1.00	1	1.00	1.00	1.00
Total.		2,676	347	2,329	1,968	148.25	890,499.21	7,287	108.21	786,361.03	1,856.30

APPENDIX F.

REPORT OF THE DIRECTOR OF NAVIGATION.

DEPARTMENT OF COMMERCE AND POLICE,
BUREAU OF NAVIGATION,
Manila, P. I., July 1, 1907.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1907:

ORGANIZATION.

On December 10, 1906, in accordance with the terms of act No. 1568 of the Philippine Commission, the bureau of port works ceased to exist as such and became a division of this bureau.

The bureau now consists of the division of vessels, interisland transportation office, light-house division, and the division of port works.

The assistant director of navigation, in the capacity of superintendent of interisland transportation, has a separate office on the water front near the old captain of the port's building, and there looks after the traffic carried by vessels of the bureau and supervises the service of the steamship companies under contract with the insular government. Divisional offices and the office of the director are on Engineer Island, at the mouth of the Pasig River.

FINANCES.

Division of vessels.—Act No. 1527 and subsequent resolutions of the Philippine Commission made available for expenses of the division of vessels and the offices of the director and assistant director of navigation the sum of ₱895,000. Of this, ₱500,000 was to come from the treasury and the balance from earnings. A total of ₱866,479.85 was expended. The balance, approximately ₱28,520, will be certified back to the treasury. Earnings for various classes of transportation were ₱450,295.48.

Light-house division.—Act No. 1527 provided ₱400,000 for the light-house division. Of this, ₱360,727.41 was expended for current maintenance work, and ₱39,272.59 for the installation of new minor lights, etc. In addition, ₱35,449 was expended from permanent improvement funds for certain specified construction work authorized.

Division of port works.—Resolution passed January 11, 1907, provided ₱88,600 for the running expenses of this division. Of this sum, ₱81,052.83 was expended. The sum of ₱900,383.50 was also expended from funds which had been provided for the permanent improvement of Manila, Iloilo, and Cebu harbors, dredging the Cagayan River near Aparri, and harbor surveys at various points in the islands.

MARINE RAILWAY AND REPAIR SHOP FUND.

Starting with ₱25,000, provided by act No. 1416 as a permanent reimbursable appropriation, the marine-railway and repair-shop fund has been augmented by profits derived from surcharging 10 per cent, the actual cost of all labor and material entering into work done, and now amounts to some ₱48,000, clear of all liabilities. This sum of ₱48,000 is for replacing such parts of the marine railway as wear out through service and to replace any parts broken. It is also available for the purchase of new machinery for the shops and the repairing of the old machinery. At the present time we are very short of small lathes, and a number will be installed during the coming year. The work performed consists principally of docking and repairing vessels for this and other bureaus of the Philippine government, for the United States Army (Quartermaster Department), and the United States Navy. It also comprises a great variety of jobs in no way connected with marine work.

In the near future large expenditures from this fund are contemplated, including an item of about ₱18,000 for the placing of a pile foundation and the building of a 100-ton marine railway for the docking of small vessels, the present 1,400-ton marine railway being inadequate to handle all the work promptly, and the expense of docking a small vessel on the large dock being out of proportion to what it should be.

DIVISION OF VESSELS.

As stated under "finances," the total expenditures of the division of vessels were ₱866,479.85. This covered salaries and wages, subsistence of ships' officers and crews, ordnance, coal, oil, other supplies for vessels, shops, storehouses and offices, cablegrams, postage and telegrams, printing and binding, hire of land transportation, maintenance of Engineer Island, purchase and construction of water craft, repair and improvement of vessels, travel on official business, pilotage, and other incidental expenses, and included expenses of the light-house tenders and all other water craft belonging to the bureau, except the dredges and scows of the division of port works.

On June 30, 1907, the fleet consisted of 15 cutters, 10 seagoing launches, 2 seagoing centerboard auxiliary ketches, 1 seagoing sloop, 4 gasoline launches, and 14 steam launches for river and harbor work. They were stationed as shown below:^a

All vessels in commission are manned, supplied, and repaired by this division, except those loaned to the United States Coast and Geodetic Survey and those leased to the United States Army.

The *Kicly*, *Naddo*, *Harris*, and *Clark* (*Merlin*) were transferred from the bureau of constabulary in August, 1906. The *Walker* was purchased, partially constructed, for ₱3,000. The *Fisher* was purchased, partially constructed, for ₱5,900—she is now nearing completion. The *Manila* and *Oeste* were transferred from the bureau of port works. The *Seagull* (*Bongao*) and *Sanderling* (*Coron*) were transferred from the bureau of customs, overhauled and repaired, and put into commission.

The *Jolo* and *Diana*, having been condemned by a board of survey, were sold at auction for ₱2,250 and ₱875, respectively.

Of the vessels out of commission, it is believed that the *Picket*, *Philadelphia*, *Cabra*, *Ogden*, *Guy Howard*, and *Suerte* should be advertised for sale, they having outlived their usefulness and being a source of expense, without bringing any returns.

PROPERTY VALUATION.

1. Present value of fleet (estimated) is.....	₱1, 847, 965. 12
2. Stores.....	206, 480. 27
3. Ordnance.....	114, 878. 01
4. Supplies and equipment on vessels.....	98, 079. 79
5. Spare parts of machinery.....	39, 800. 00
6. Tools and machinery in shops.....	151, 974. 40
7. Marine railway.....	201, 563. 22
8. Scows, lighters, etc.....	16, 470. 00
9. Hoisting engine, fire pump, etc.....	8, 164. 37

Total value, exclusive of grounds, buildings, and fixtures... 2, 685, 385. 18

In figuring the valuation of property covered by items 1, 6, 7, 8, and 9, 10 per cent has been written off from valuation last year for depreciation.

Seagoing vessels visited 4,370 ports, carried 14,915 passengers and 6,976 tons of freight, and steamed 290,000 miles. There was such a demand for their services that vessels were in port rarely except for necessary repairs. At the beginning of the year there were 11 cutters in operation, but this number was reduced to 8 during the first half of the fiscal year.

INTERISLAND TRANSPORTATION OFFICE.

The total earnings of vessels of the bureau were ₱450,295.48. The charges were made up of rentals and charters of cutters, launches, and lighters, and

^a This list has been omitted and is on file in the Bureau of Insular Affairs, War Department.

transportation of passengers and freight. While it has been proper to take vessels off routes serving ports already given fair transportation facilities by commercial steamers, there is plenty of work left for the bureau to perform which will not conflict with the interests of the merchant marine, but will give the provinces connection with Manila and other ports, assuring them a market for their products and generally creating contentment. However, the regular routes now operated over by no means give such a volume of traffic, nor make such a showing of earnings by the bureau, as those routes from which our vessels were excluded when contracts were entered into between the Government and Ynchausti & Co., Manila Transportation and Shipping Company, Smith, Bell & Co., the Compañía Marítima, and the Compañía General de Tabacos de Filipinas. Entering into contracts with these steamship companies has resulted in giving a much better service than heretofore between the principal ports of the islands and the need of competition by government vessels has, therefore, been removed. On the other hand, placing government vessels on the less traveled routes over which merchant boats could not afford to operate leads to the agricultural development of new sections, and this development will eventually make the new sections of such importance that commercial vessels will find it profitable to go there after traffic, and thus benefit themselves and the producers. It is believed that much good has already resulted from the establishment of secondary routes and that there should be more of them. Route 3, which connects Manila with ports in Palawan Province, is the only primary route which has not been turned over to a commercial steamship company. A cutter continues operating over this route and pays a large percentage of the cost of its maintenance. The route, however, would not be profitable to a commercial line. It seems to be the consensus of opinion that as a result of the government entering into contracts with private steamship companies and giving them its traffic—in consideration of improvement of the merchant service and maintenance of uniform and more reasonable rates—the service of the principal steamship companies throughout the islands has greatly improved. Passenger and freight accommodations are better, there is a known frequency of service, and discrimination between shippers has been prevented. Not only does the public seem satisfied with the changes effected, but the steamship companies themselves are pleased and their earnings are evidently satisfactory. Regular sailings, efficient service, and fair and uniform rates must result in accomplishing much good for the islands.

The sum of ₱3,000 is being expended to repair the building known as the captain of the port's, that it may be leased to a concern known as the Union Ticket and Information Company. Much benefit is expected from this.

LIGHT-HOUSE DIVISION.

When the Philippine Islands were taken over by the United States Government there were in existence 34 lights of all classes, 27 of which were in condition for operation. There are now 117 lights in operation, as follows:

Flashing lights.....	28
Occulting lights.....	9
Fixed lights.....	3
Port lights.....	28
Lens lanterns.....	47
Electric-arc lights.....	2
Total	117

In addition to the lights, there are now 109 buoys and beacons as compared with 31 in 1898.

Of the above, 16 lights were installed, 19 buoys laid, and 6 beacons erected during the past fiscal year. During the same period 4 lights and 1 buoy were discontinued.

Among the lights installed during the year were: Third-order flashing white light at Cape Bolinao; sixth-order light at Apo Island; sixth-order port lights at Mataja Island, Sialat Point, Ungay Point, Nugas Island, Ocata Island, Ambolon Island, and Batag Island—the latter to be used only during time of construction of new third-order light station there.

At the beginning of the year there was practically no money available for the construction of lights in accordance with the permanent improvement scheme, but on January 11, 1907, the Commission authorized the construction

of a third-order light on Batag Island, northeast coast of Samar, at a cost of ₱85,000, and provided ₱15,000 to be expended in the construction of minor light stations at San Miguel Island, Isabel Island, and Punta Pata.

Batag work is already well under way. Barbier, Benard & Turenne (Paris) apparatus has been contracted for, and it is expected that the light will be in operation by January, 1908. This light is of great importance, as it will mark the entrance of one of the most traveled waterways in the archipelago and be visible 26 miles. It will be invaluable to vessels coming from Australia, army transports from the United States, and all other vessels passing through San Bernadino Straits en route to Manila or other Philippine ports.

Work at San Miguel Island is also under way, and it is expected that this station will be completed in October, 1907.

Construction of the lights on Isabel Island and at Punta Pata will be commenced in the near future.

When the third-order light on Batag Island and the lights on San Miguel and Isabel Islands are in operation a vessel "picking up" Batag light 26 miles at sea and passing through San Bernadino Strait will not lose sight of a light during the passage to Manila.

The small machine shop of this division has done much valuable work repairing delicate light-house apparatus, constructing clockwork for occulting and flashing lights, etc. It is specially fitted for the manufacture and repair of parts which would otherwise have to be purchased abroad at great expense. The work is done entirely by Filipinos, under the supervision of an American master mechanic.

PORT WORKS DIVISION.

The following work was done by the division during the year:

MANILA.

Dredging.—Under contract approved August 9, 1905, 532,883 cubic yards of material was dredged from the outer harbor and placed in the Luneta extension fill at a cost of ₱127,891.92. This completed the contract, under which a total of 1,904,627 cubic yards was dredged at a cost of ₱457,110.48.

Luneta extension.—Under contract approved August 9, 1905, 209 linear feet of timber bulkhead was accepted, the cost being ₱4,180. Total length of bulkhead built was 4,409 feet at a cost of ₱88,180. Riprap, to the amount of 4,383 tons (2,240 pounds) was placed in the Luneta extension revetment at a cost of ₱11,395.80. Total quantity of riprap placed was 79,730 tons, at a cost of ₱207,298. This contract was closed June 3, 1907.

Luneta extension, repairs to break of May 1, 1906.—Under contract approved May 25, 1906, 947 tons of riprap were placed in the break of May 1, 1906, at a cost of ₱2,462.20. Contract was closed June 3, 1907. Total quantity of riprap placed was 4,412 tons, at a cost of ₱11,471.20. Extra work to the value of ₱2,079.91 was done on the break of May 1, 1906. This completed these repairs.

Luneta extension, repairs to break of May 18, 1906.—Under contract approved May 25, 1906, 3,974 tons (2,240 pounds) of riprap were placed in the break of May 18, 1906, at a cost of ₱10,332.40. Extra work to the value of ₱10,768.58 was done in repairing this break. The government furnished saualo to the value of ₱1,339.80. The contractors have not been paid for this work, as the question of responsibility is to be made the basis of a suit.

Luneta extension, repairs to break of February 17, 1907.—Under contract approved March 9, 1907, 536 tons (2,240 pounds) of riprap were placed in this break, at a cost of ₱1,232.80; also 607 tons (2,240 pounds) of quarry dirt, at a cost of ₱1,335.40, and 3,715 feet B. M., of Oregon pine timber, used in repairing the sheet piling at the site of this break, at a cost of ₱371.50. Extra work to the value of ₱78.40 was done on this break.

Luneta extension, repairs to break of April 19, 1907.—Under resolutions of February 15 and April 30, 1907, extra work to the value of ₱53.75 was done in repairing this break.

Luneta extension, repairs to break of April 20, 1907.—Under resolutions of February 15 and April 30, 1907, extra work to the value of ₱187.47 was done in repairing this break.

Luneta extension, repairs to break of April 14, 1907.—Under resolutions of February 15 and April 30, 1907, extra work to the value of ₱12.31 was done in repairing this break.

Luneta extension, reenforcing superstructure.—Under resolutions of February 15 and April 30, 1907, extra work to the value of ₱4.46 was done in reenforcing superstructure to prevent further breaks.

East breakwater extension.—Under contract approved August 9, 1905, 1,244 tons (2,240 pounds) of riprap were placed in the east breakwater extension, completing the structure, at a cost of ₱3,234.40. Contract was closed May 17, 1907, the total quantity of rock being 23,188 tons, and total cost ₱60,288.80.

Dredging.—Under contract approved December 6, 1906, 442,505 cubic yards of material was dredged from the outer harbor and placed in the Luneta extension, at a cost of ₱106,201.20. Work was started in January, 1907, and was finished in June, 1907, completing the Luneta extension. Contract was closed June 4, 1907.

Wharf abutments.—Under contract approved January 12, 1907, 236 tons (2,240 pounds) of riprap were placed as a foundation for wharf abutment B, at a cost of ₱826, 122.94 cubic yards of concrete at a cost of ₱2,286.68, 1,610 pounds of reenforcing steel at a cost of ₱96.60, and 305 tons (2,240 pounds) of quarry dirt fill back of the concrete wall of the abutment at a cost of ₱671. This abutment failed by settling on May 13, 1907. Designs for new abutments are being prepared and will be submitted shortly.

Steel wharves.—Under authority contained in paragraph 88 of contract approved May 24, 1906, extra work to the value of ₱600.41 has been done in preparation for the inshore row of cylinders. This work was discontinued on May 14, 1907, after wharf abutment B had failed, as it is proposed to build a different style abutment, which will do away with the present necessity for any further extra work. About one-third of the steel for these wharves has been delivered. Sixty-eight cylinders for encasing piles have been completed at the contractors' shops, and six of these have been delivered. Pile driving was commenced on June 1 and piles for the first bent were completed June 6. These piles show greater supporting power than was expected and were very difficult to drive, the average penetration under the last blow of a 3,600-pound hammer falling 30 feet, being about 1 inch. Work of concreting these piles was suspended, owing to the fact that the piles had spread in driving so that the cylinders would not fit over them with the proper clearance between the piles and the inside edge of the cylinders.

Lower Pasig River.—Dredge No. 1 was at work for nine months and removed 300,944 cubic yards of material from the river and bar at a cost of ₱0.152 per cubic yard. Dredge No. 2 was at work for seven months and removed 293,641 cubic yards of material at a cost of ₱0.141 per cubic yard. The channel at the mouth of the river has been widened in order to permit ships to leave port without striking the bar as they make the turn outside the river.

Upper Pasig River.—Dredge No. 3 was at work for three months on the Napindan bar and removed 36,875 cubic yards of material at a cost of ₱0.176 per cubic yard. Work with this dredge was stopped in September, 1906, and the dredge laid up. The hull was badly in need of repairs and the machinery was in poor condition. This machine was not originally designed as a dredge should be—the engine was but 20 horsepower, when 100 horsepower is required. A new design for this dredge has been made and the plans are nearly complete. Dredge No. 7 was at work at San Felipe Neri for four months and removed 13,340 cubic yards of material at a cost of ₱0.836 per cubic yard. The work of this dredge is hampered by the lack of dump scows, those on hand being insufficient to keep this dredge and dredges 1 and 2 working to their full capacity. A large part of the material from this dredge was used in making a fill back of the river wall at the Maestranza, and it therefore has value to offset the high price of the dredging. Dredge No. 5, working the river in rear of the post-office, removed 2,464 cubic yards of material at a cost of ₱1.073 per cubic yard. Material from this dredge was deposited back of the Maestranza wall.

The lower river is now in good condition and the plant available is able to keep it properly dredged.

The upper river contains numerous bars which, at low water, are serious obstacles to navigation.

CEDU.

At the beginning of the fiscal year 1907—during July and August, 1906—considerable delay was caused by heavy seas, making it impossible to deposit concrete with a floating derrick. The continual pounding of heavy seas caused a section of the bulkhead, in a mud deposit near the center of the basin structure, to drift inward. During September the typhoon signals were displayed about

once a week, and on the 27th the heavy sea then running destroyed 264 linear feet of double bulkhead. The break occurred in the section that had been battered out of line during the storms of July and August, and it is probable that the continued battering of previous storms had weakened the structure. Only one block of concrete was placed during September. In October no work, except the removal of the wreckage from the bulkhead destroyed, was done until the 26th, when a few bulkhead piles were driven. A second concrete mixing plant was completed during this month. In November no work was attempted until the 13th, because of continued rough weather. A new foundation driver was completed during this month. During December very little work was done because of frequent breakdowns in the plant. No concreting had been done from September 21 to December 29. In January a fair amount of work was done, but considerable trouble was encountered in getting good gravel, and the screening was a source of constant trouble and delay. The buckets used in depositing concrete were faulty and a considerable loss of concrete was caused by misdumping. In February arrangements were made by the contractors to work night and day on the concreting. The gravel was improved by the addition of screened gravel purchased from the natives. During March the bulkhead on the basin section was completed, and the bulkhead driver was moved and started working on the extension of the bulkhead toward Smith Bell & Co.'s wharf. The bulkhead driving progressed very slowly because of a stratum of hard sand clay encountered at this point. A record of the various delays occurring in the work was kept this month, and the plant showed an efficiency of only 40 per cent. In April the foundation piling on the basin section was completed and the pile driver, which was in a dangerous position, was dismantled. The plant showed an efficiency of only 38 per cent, due mainly to the difficulty of getting men to work nights. The basin section of the wall was completed during the month of May. The dredge arrived May 11, but was unable to start work before the 30th, because a casting on one of the spud wells was lost in towing from Iloilo. More work was accomplished this month than any month previous, and the efficiency of the plant increased 25 per cent, the percentage of efficiency being 46 per cent. The contractors drove a 4-inch pipe to a depth of 113 feet at the inner side of the wall at the Smith Bell & Co.'s wharf and obtained a flowing well of clear soft water, which is excellent for boilers. They have erected a small steam pump and force it into a distributing plant or tank, thence pipe it all over the work. During the month of June the work progressed at a fair rate of speed until the 23d, when a severe storm occurred, which broke the outer low-water bulkhead walling and drove inward 13 feet of sheet piling at a point near Smith Bell & Co.'s wharf. The entire bulkhead was swinging through an arc of 2 feet before this break occurred. The weather continued rough until the 26th, when repairs were commenced. During this storm the dredge broke a spud and was laid up until the close of the month. Efficiency for this month was 44 per cent. A series of borings were taken over an arc east of the government wharf to determine the proper location for an extension of the quay wall. The amount of work completed up to the end of the fiscal year 1907 was as follows:

Outshore bulkhead (not to be paid for).—12,511.2 linear feet of bulkhead piling and 174,126 feet B. M. of sheet piling had been driven and 16,110 feet B. M. of walling had been placed. This work completed 1,607 linear feet of double bulkhead.

Foundation piling.—Of foundation piles 70,024 linear feet had been driven, covering 1,537.7 linear feet of wall.

Concrete wall.—Of concrete 4,054.7 cubic yards had been placed in the superstructure, covering 1,392 linear feet of wall, and 15,245.2 cubic yards had been placed in 117 blocks of the substructure, covering 1,423.4 linear feet of wall. Of cement 20,547½ barrels had been used on the work and 130½ wasted by losing batches overboard. Of concrete 138.9 cubic yards had been deducted for misdumping.

Dredging.—Of material 41,842.5 cubic yards was dredged and placed in rear of bulkhead wall.

A detailed statement of the work done, the amount earned by the contractors, and the quantity and value of cement used is given in Table I.^a

At the close of the fiscal year the wall was completed from its western extremity as far as the Smith-Bell wharf, with the bulkhead and foundation

^a This table has been omitted and is on file in the Bureau of Insular Affairs, War Department.

piles extending a little beyond that point. The fill had been partly completed back of the basin section of the wall.

The original time set for the completion of the contract was February 1, 1906, which was extended in June, 1904, to September 1, 1906. In August, 1906, the time was further extended to September 1, 1907. It is not at all probable that the work will be completed at the time now set.

ILOILO.

The dredging was completed, 295,549 cubic yards of material having been dredged during the year, and extra work to the amount of ₱325.66 done. The contract was completed on March 11, 1907, the amounts of the various items being as follows: 24,980 linear feet of piling, 2,747 cords of fascines, 34,925.5 tons of stone, 476,049 cubic yards of dredging, and ₱1,714.73 worth of extra work.

The material dredged was very heavy—consisting of sand and gravel, with occasional pockets of mud. Obstructions were frequently encountered, causing breakdowns and delays. The material dredged was placed behind dike X, south bank dike, and the dike on the military reservation.

	Cubic yards.
Total amount of material dredged.....	645,317
Total amount of material paid for.....	476,049
Total amount of material dredged in excess.....	169,268

Extensions of time under this contract were granted as follows: November 1, 1905, to May 1, 1906; May 1, 1906, to November 1, 1906; November 1, 1906, to March 1, 1907.

The work was completed on March 11, 1907, without application for extension of time to cover the last ten days. The expenses of inspection and superintendence were charged against the contractor for the period from May 1, 1906, to March 11, 1907. In addition he was charged a penalty of \$3 per day, in accordance with the contract, for the period from March 1 to 11, 1907.

Additional work was authorized at Iloilo May 17, 1907, by act No. 1650, which appropriated the sum of ₱170,000 to be used in repairing the present river wall, constructing not less than 300 feet of new wall, and dredging an extension of the present channel and a turning basin in the Iloilo River. This item of dredging is contingent upon the subscription by private parties of ₱25,000 for the same purpose. A party is now engaged in making the necessary investigations and estimates for the proposed work. It is understood that efforts are being made to raise the ₱25,000 by private subscription, but thus far no notice has been received of its having been deposited with the insular treasury as required by the act.

IMPROVEMENT OF CAGAYAN RIVER.

The Commission, on March 27, 1907, authorized the sending of a dredge to the Cagayan River, province of Cagayan, Luzon, to be operated in the improvement of the river under an arrangement with the Compañía General de Tabacos de Filipinas, whereby the government pays for the superintendence of the work and the supplies for the dredge and the company furnishes the labor, and moves the dredge from place to place.

One of the Priestman dredges was equipped for the work and, after repeated efforts, was finally towed to Aparri, reaching there May 15, 1907. Owing to parts lost on the trip and breakage of machinery, no dredging was done before the close of the fiscal year. The time was employed removing snags from the river and in improving the condition of the dredge.

INVESTIGATIONS AND SURVEYS OF RIVERS AND HARBORS.

The survey of Tagbilaran, Bohol, in progress at the beginning of the fiscal year, was completed, and surveys were made at Loay River, Bohol, at Calbayog and Laoang, Samar, and at Lucena, Tayabas. Some further investigation was made at San Fernando, Union, to obtain information in addition to that developed by a former survey.

Reports were submitted covering the surveys of Tagbilaran, Port Batan, Capiz, Escalante, Danao River, and of Abulug Canal and Cagayan River.

Preliminary examinations were made of Calbayog, Legaspi, Port Sula, Coal Harbor, Tabaco, Jimamaylan, San Juan de Ilog, San Jose de Buenavista,

Tacloban, Pasacao, Guinayangan, Talcauayan Bay, Ragay Bay, Bantuan Point, Port Pusgo, Pagbilao, Lagulmanoc, Lucena, Batangas, and Dagupan.

At the close of the year two parties were in the field—one at Lagulmanoc, Tayabas, and the other en route from Laoang, Samar, to Jimamaylan, Negros.

PASIG RIVER INVESTIGATIONS.

By resolution adopted August 22, 1906, the Commission allowed ₱5,000 for investigations in regard to the improvement of the port of Manila and other harbors. Under this authority an investigation has been made to determine the probable cost of carrying out certain recommendations of a commercial committee on the use of the Pasig River and its walls. The specific questions to be determined are:

1. The cost of the erection of a modern steel bridge across the Pasig River in line with Calle Rosario, and of the removal of the bridge of Spain.

2. The cost of a bridge for the discharge of cattle from ships at a point on the river near the Vitas bridge.

3. The cost of the extension of the present river wall from the Maestranza to the river wall at the moat just beyond Fort Santiago, and of the fill thereby rendered necessary.

4. The cost of changing the present river lines between the bridge of Spain and the Santa Cruz bridge to conform to the recommendations of the committee.

Borings have been made on the sites of the proposed Rosario bridge and river walls. Estimates have been made of the cost of most of the work involved. The absence on leave of the engineer assigned to this work, and his subsequent resignation, has delayed the completion of the work outlined.

Résumé of financial statement.

Expenditures during fiscal year 1907:

Improvement of the port of Manila.....	₱423, 753. 16
Improvement of the port of Cebu.....	289, 919. 05
Improvement of the port of Iloilo.....	224, 396. 15
Harbor surveys, ports of Philippine Islands.....	17, 778. 37
Surveys and investigations, Pasig River.....	3, 597. 09
Repairs to post-office dock, Manila.....	975. 64
Dredging Cagayan River, Luzon.....	1, 016. 07

Total expenditures fiscal year 1907..... 961, 436. 33

The above ₱961,436.33 represents payments actually made. Liabilities exist aggregating ₱20,000, making the total expense of the division ₱981,436.33.^a

IN CONCLUSION.

Division of vessels.—In view of the importance of developing traffic on secondary routes, special attention will be paid to that feature. Several new routes are being considered, and several more launches will be put into commission in order to carry out the schedules arranged.

It is recommended that four or five of the old launches not in commission be sold, the proceeds to be used in purchasing a seagoing launch of the *Ranger* type and, if a sufficient balance remains, one boat for upriver use.

It is the intention to extend the upper decks of a few cutters, as has already been done on the *Potillo* and *Basilan*, and to refasten several of them. As many cutters will be improved in these respects as the appropriation for the fiscal year 1908 will admit of.

Batan (Albay Province) coal is being experimented with on several of the cutters. The results obtained have been more or less satisfactory, and its use may become quite general. Just now it is practicable to use it only on those vessels so stationed that they can take their supply direct from the mine. From numerous experiments carried on aboard vessels, it has been found that by using the ordinary grate bar the consumption of this coal is 60 per cent greater than when using Australian or Japanese coal. The grate bars have been changed on several cutters and the coal experimented with until this

^a Tables showing these figures in detail have been omitted and are on file in the Bureau of Insular Affairs, War Department.

excess has been reduced to 35 per cent. Possibly when coal is mined from the deep levels it will be found to approximate in quality the foreign coal referred to.

Light-house division.—Members of the light-house board are of the opinion that a large light should be constructed on an island east of Zamboanga for the purpose of aiding vessels passing through Zamboanga Strait, and plying between China, the Philippines, Australia, and Java.

Port works division.—Aside from continuing the work of improving the harbors at Manila, Iloilo, and Cebu, and other work already started, recommendations will be made that several small harbors in the islands be improved. It is thought that much effective work can be accomplished at small expense by making more accessible many ports to and from which a fair volume of traffic moves. Survey parties are doing considerable work toward selecting the ports which should be given preference, and in deciding the nature of the improvements it will be best to undertake, and, in addition, are surveying harbors with the view of selecting ports for railroad termini.

The demand for berthing space in the Pasig River, Manila, is such as to make it imperative that the river wall on the south side be extended at least as far upstream as the Bridge of Spain, and that the area behind the wall be filled in. Material for filling can be supplied by dredges working up the river.

The two steel wharves for Manila will be completed during the fiscal year 1908, and will give about 2,500 linear feet of docking space for foreign vessels, which will do much to relieve the congestion of traffic in the river, particularly as regards the handling of cargo in cascos. Wharf B will be 70 feet wide and 600 feet long, and wharf A 110 feet wide and 650 feet long. Wharf B is located 725 feet east and wharf A 1,500 feet east of the United States army transport dock. The wharves when completed will have cost in the neighborhood of \$900,000. As soon as completed, the Manila Electric Railway Company contemplates running lines to both wharves, and cargo may be carried cheaply to all parts of the city. As a temporary convenience a small wharf will shortly be built at the end of the old fill, where ships' launches and boats may land their passengers near the Luneta.

Number of American and Filipino employees.—There were 1,365 officers and employees of the bureau on June 30, 1907. Of this number 109 were Americans, 1,204 Filipinos, and 52 Chinese. The Chinese are used as blacksmiths, boiler makers, and carpenters in the shops. For blacksmithing and boiler making there is little prospect of replacing the Chinese with native workmen. Filipino boys employed as apprentices in the machine shops take readily to that class of work and give promise of becoming efficient machinists. There is usually a force of from 150 to 250 men employed on the marine railway and in the shops.

Respectfully submitted.

FRANK P. HELM,
Director of Navigation.

The SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

APPENDIX G.

REPORT OF THE DIRECTOR OF COAST SURVEYS.

MANILA, P. I., July 1, 1907.

SIR: I have the honor to submit the following report of the work executed in this bureau during the fiscal year ended June 30, 1907.

FIELD WORK.

The operations of the various field parties during the fiscal year are briefly epitomized as follows:

WEST COAST OF LUZON.

The offshore hydrographic survey from Balingasay Point to Calman Point, and from Guia Point to Capones Islands, was completed between December 1, 1906, and February 27, 1907, by the party on the steamer *Romblon*, and in connection with this work the topography in several places was strengthened and extended. This completes the general survey of the north and west coasts of Luzon, from Aparri Point to a short distance south of Lagulmanoc Bay, with the exception of the hydrography from Aparri to Culili Point and that for a stretch of about 5 miles south of the Frailes Islands.

The gap in the general survey (triangulation, topography, and hydrography) between Talin Point and Cape Santiago was then undertaken by the *Romblon* and completed between March 4 and 30, 1907.

At the beginning of the fiscal year Assistant Ferguson with first the launch *Polee* and afterwards the *Erica* was engaged in the extension of the main Philippine triangulation to the southward between Luzon, Mindoro, and Marinduque. This scheme was completed to the line from Dumali Point, Mindoro, to Baltazar, one of the Tres Reyes Islands, and a base and azimuth measured at Calapan, Mindoro. On September 1 the party returned to Manila.

From October 8, 1906, to January 22, 1907, Assistant Ferguson was employed in strengthening and completing the central triangulation of Luzon between Dagupan and Caballo Island, at the entrance to Manila Bay, the work including a base measure near Lingayen.

VERDE ISLAND PASSAGE.

The gap in the hydrographic surveys between Verde Island and Mindoro was assigned to the *Marinduque*, which had to await the arrival of a new shaft from Hongkong and could only be employed in the meantime in sheltered waters. The work began on May 22 and after completion the party was employed until June 18 on a general topographic and hydrographic survey of the north coast of Mindoro west of Port Galera. After the date named the steamer returned to Manila for the installation of the new shaft.

PORT GUBAT AND PORT SULA.

The *Romblon*, when en route to the scene of main season's work, was directed to search for a reported danger in the entrance to Port Gubat. This was found, and an additional small piece of work undertaken was the filling in of the gap between the surveys of Assistants Derickson and Denson in Port Sula, a valuable refuge for the shipping using the port of Legaspi during the typhoon season. This work, involving additional hydrography and topography was successfully completed between May 13 and 17, 1907.

* EAST COAST OF LUZON.

The general survey of the coast line from Maqueda Channel to San Miguel Bay, triangulation, topography, and hydrography, were being executed at the beginning of the fiscal year by the party on the steamer *Fathomer*, which left Manila on May 2, 1906, and returned thither November 1.

The general survey, triangulation, topography, and hydrography westward of San Miguel Bay to Jesus Point and connection with the Calaguas Islands were completed by the party on the steamer *Romblon* in the period from May 22 to October 24.

The party on the steamer *Marinduque* was engaged from April 28 to November 3, 1906, in general surveys from Alabat Island to the east coast of Polillo Island.

The work of the three steamers herein referred to was carried on amid grave inconveniences and until the end of August the *Marinduque* had to make a round trip of about 420 miles and the *Romblon* one of 250 miles in going for coal and supplies, their base until then being Legaspi. The section in which the ships worked was most inadequately represented on all available charts, the coast line as shown being but little more than a result from a running survey. The water area was thickly interspersed with islands inaccurately shown, both in size and location. The available soundings were very few in number, and, as a climax, the summer and fall deserves an unusually evil reputation for the number of their cyclones. They began in May and lasted through September, making the position of the ships very hazardous on this dangerous coast, where the location of harbors of refuge was one of the first duties that had to be attended to.

The *Marinduque* experienced five typhoons in September—the number for the season, May to September, being 10. The typhoons, besides endangering the ships, caused serious delays by their destructive action on all classes of signals, triangulation and hydrographic—every storm necessitating the rebuilding of nearly all in use. The poverty of the people along this coast was also a cause of delay, as almost anything used for signals was precious in the eyes of these wretched people, and the chiefs of parties were unanimous in reporting the serious amount of time lost in replacing signals destroyed for the wire, tacks, or cloth used on them, no cutting or slashing of materials seeming to make them worthless where poverty was so supreme.

In addition to the wholesale change in the representation of the general coast line that was made in this season and the development of the Lamit typhoon anchorage, another notable result deserving of special mention was the survey of Hook Bay, a very excellent typhoon harbor of refuge in Polillo Island. Port Lampton and Burdeus Bay were especially developed at the instance of the honorable secretary of commerce and police, the latter offering a fine outlet for the large coal deposits reported to exist on Polillo Island.

The surveys of this season, among other changes, reduce the area of Polillo Island almost by half.

CATANDUANES ISLAND.

On the return voyage to Manila of the *Marinduque* the party was ordered to make an examination for a dangerous shoal reported off Cabugao, south coast of Catanduanes, with the result that the danger was located and fully developed.

On June 16, 1907, the steamer *Fathomer* left Manila for the north coast of Catanduanes Island, to take up the general surveys on the north and east coasts which remain to complete the work of charting in this section.

EAST COAST OF LUZON—WORK IN 1907.

On May 17 the *Romblon*, having established an automatic tide gauge at Mercedes for control of hydrographic observations, began operations in the vicinity of San Miguel Bay to connect the triangulation executed last season by the *Pathfinder* and *Romblon* and extended the general survey of the coast up San Miguel Bay. On completion of this work it will resume the work of last season in the vicinity of Jesus Point, extending it west and north.

NORTH COAST OF SAMAR.

A party with a chartered launch, first under the direction of Assistant Quillian, and later under Assistant Maupin, extended the general survey of the north coast triangulation, topography, and hydrography of Samar from Laoang to a junction, at the Balicuatro Islands, with the work executed by the *Pathfinder* in 1902.

NORTH AND EAST COASTS OF SAMAR.

The party on the *Pathfinder* began operations off Samar on May 8, 1906, and on November 17 closed operations in Matarinao Bay, the work embracing triangulation, topography, and hydrography.

The operations of our parties have now perfected the surveys of every harbor suitable for commerce or refuge on the north and east coasts of Samar,

political and military reasons making this a desirability of the highest importance. The island was in a badly disturbed condition while the work was in progress, and it is a matter of sincere congratulation that our parties did not suffer any harm at the hands of the savage Pulahanes, for at one station within sight of an observing party troops were landed to clear the enemy from the near vicinity. At the mouth of the Suribao River one of our parties met with a sad accident in the overturning of a whaleboat, which resulted in the death of one of our seamen, the remainder of the party actually owing their lives to the admirable conduct of the natives living near where the accident occurred, who rushed to their aid and at the imminent risk of their own lives dashed in and dragged the helpless crew ashore. The officer in charge was insensible when rescued. The bravery of the natives was splendidly supplemented by the generosity of the military authorities, who, as soon as notified, sent a detachment of scouts to bring in the destitute party and then supplied every comfort and assistance that was necessary for the men.

GUIMARAS STRAITS, EAST COAST OF PANAY, AND NORTH COAST OF NEGROS.

The general survey in this vicinity was carried on by the party on the *Research* throughout the year, except during two weeks in July, 1906, and about three weeks in February and March, when the vessel was being overhauled and undergoing repairs.

On July, 15, 1906, the general survey north of the line from Tomonton Point, Negros, to Banate, Panay, was taken up and carried as far north as Ragalumbi Island.

Early in May the triangulation had been executed north to a connection with the Zapotes Islands and Jintotolo light and eastward to the Don Islands. The party then took up the hydrography and topography in vicinity of Cadiz Nuevo, working eastward along the north coast of Negros.

SOUTH AND WEST COASTS OF PANAY.

The hydrography off these shores, from Oton to San José de Buenavista, was completed by a party under Assistant Latham, operating with a chartered launch. Operations began January 15 and terminated on May 27, the triangulation and topography having been executed last year.

WEST COAST OF PANAY.

Assistant Maupin, with a shore party, starting at the north end of the Panay shore work, on the west coast, extended the triangulation through to the north coast of the island, and the topography was simultaneously carried to the Bugan River. The field operations of this party began on January 7 and closed on May 27.

WEST COAST OF LEYTE.

The party on the steamer *Marinduque* on December 13 proceeded to Ormoc, Leyte, to take up the survey between Leyte and Cebu, a continuation of that done in this vicinity in the last fiscal year. The previous work comprised mainly some triangulation and topography and a small zone of inshore hydrography. This season an azimuth was measured and the triangulation was strengthened and expanded from Bulalagui Point (the most northern point of Cebu Island) to Limasaua Island, south of Leyte, and the offshore hydrography developed westward of the Camotes. The season extended from December 16 to April 21.

NORTH COAST OF MINDANAO.

The extension westward of the general survey of the shore line and water area of Iligan Bay was carried on by a party under Assistant Latham, with a chartered launch. The work was taken up on July 1 and continued until December 1.

The survey connects our previous work about Iligan with Polo Point, and one leading feature secured was the location and charting of the very dangerous Iligan reef. The work will be very important in the development of a country which possesses very great natural resources.

SOUTH COAST OF MINDANAO.

The remarkable growth of the importance of the country in the vicinity of Zamboanga and the wonderful improvement in the commerce of this port were convincing reasons for taking up the survey of southern Mindanao, from the astronomical station as an initial point particularly, as it promised to enable

us to settle definitely and promptly the disputed point about the existence of certain dangers to navigation in the Basilan Strait, which were a cause of grave concern to the masters of large vessels using this passage. The party on the steamer *Fathomer* began operations on December 10 and closed on May 2, having carried the combined survey operations to Buluan Island.

SOUTH COAST OF MINDANAO, GULF OF DAVAO.

The enterprise of the American settlers, who have done so much to attract attention to the possibilities for hemp and cocoanut raising about the shore of this gulf, made it very important to insure good charts for this area, as there is no locality in the southern section of the archipelago, except the country about Zamboanga, which is at present attracting so much notice and attention. Accordingly on the return of the *Pathfinder* from her trip to Hongkong for repairs she was at once dispatched to Davao to take up the ends of last season's operations and extend the survey. The progress made this season was so satisfactory that it is evident another similar one should bring the work in this gulf to a conclusion.

To arrange for improvements in the representation of the entrances to the Gulf of Davao and the connection with our surveys, now terminating near Quidapil Point, astronomical determinations have been made at Pola and Tinaca points and Cape San Agustin. Running surveys have also been made in several of the trips made to Caldera Bay for coal which will give a considerable addition of strength to our representation of the coast from Malalag Bay to Quidapil Point, which for the present has to be taken from Spanish charts that are evidently not based on work of much exactness.

TIDAL AND MAGNETIC OBSERVATIONS.

Elaborate series of tidal observations form part of the programme of all the hydrographic parties, and in addition, two self-registering tide gauges have been maintained throughout the year at Manila and Iloilo. In conjunction with the insular bureau of navigation, division of port works, we operate the self-registering gauge at Cebu and receive its records.

Regular magnetic operations form part of the plan of work for the four large steamers, and the reception of a new standard set of magnetic instruments has been taken advantage of to plan a systematic use of them in different sections where the vessels operate.

THE SURVEY STEAMERS.

The *Pathfinder* has been steadily at work except from December 1 to February 8, during which she was sent to Hongkong for the installation of new masts, and from June 15 to the end of the fiscal year, when she was in Manila for docking, painting, minor repairs and outfitting for her next field season.

The steamer *Research* was only absent from the working grounds five weeks, the time required for two semiannual overhauls and repairs.

The steamer *Fathomer* was in Manila from October 24 to December 5, and from May 9 to June 15. This steamer has not required any extensive repairs and has proved most satisfactory as a working vessel.

The steamer *Romblon* was in Manila from October 27 to December 6, and from March 30 to May 10, repairing and outfitting.

The steamer *Marinduque* returned to Manila on November 3, and, after repairing and outfitting, sailed for the work between Leyte and Cebu on December 12. She returned to Manila on April 21, and the list of repairs was a very moderate one, but on examination of her starboard shaft it was found in such a condition that the inspector pronounced her unfit for work in any but sheltered waters. When the steamer was in for repairs in last December one of the requirements was an examination of the shafts, and the inspector then, after declaring her in A 1 condition, pronounced her "fit for any service." The port shaft is unimpaired and while she was waiting the arrival of a new shaft from Hongkong the steamer has been assigned work off the north coast of Mindoro. The vessel, after making all repairs but those on the shaft, sailed for the working grounds on May 22, returned to Manila on June 18, and has since been in Manila having the new shaft fitted and installed.^a

^aA large amount of detailed information has been omitted as to field force and work accomplished and is on file in the Bureau of Insular Affairs, War Department.

The records for the last three years—one of which was the year before the Coast and Geodetic Survey fleet was increased by the addition of the two coast-guard boats, in another these vessels were available for the last half of the year only, and the last being the year for which this report is made—show a very satisfactory increase in the corresponding statistics for this augmentation in our force, as indicated by the following table:

Comparative statistics of field work in the past three years.

	1905.	1906.	1907.
Hydrography:			
Area developed, square statute miles.....	2,498	2,837	6,405
General coast line, statute miles.....	307	419	783
Number of soundings.....	195,004	296,853	404,653
Topography:			
General coast line, statute miles.....	257	443	873
Detailed coast line, statute miles.....	494	626	1,495
Triangulation:			
Progress in statute miles.....	187	647	797
Points determined.....	409	776	646
Points occupied.....	176	343	344
Tide stations.....	17	27	43
Magnetic stations.....	8	—	25

Comparing the equipment of the survey in the three years contrasted, the proportion of strength should be in the respective ratios 3½, 5, and 6. The only items in which 1907 falls below what should be its showing, in comparison with either of the other years, are the quantities under the heading triangulation for "points occupied" and "determined," this being due to the fact that, except for one month, the party organized specially for triangulation was employed in areas which had already appeared in our tables of statistics.

The large sum total of the area of hydrography developed for this fiscal year is due to the fact that the steamers in Verde Island Passage, Sibuguey Bay, the section between Leyte and Cebu, in the Gulf of Davao, and in the offshore hydrography off the coast of Zambales developed a large area where the depth of water did not make it necessary to run the close lines and take soundings as frequently as is the case where shoaler waters prevail; but although the sum total of the number of soundings should then be less, as soundings in deep water take so much more time for each cast than where the waters are comparatively shoal, the figures for this item, instead of any diminution, show an increase. They are 107 per cent over the returns for 1904-5 and 40 per cent above those for 1905-6, as against 43 per cent and 20 per cent due to difference in organization and equipment.

The final results for output of completed coast line, on the basis of one line of general progress for each mile of general coast hydrography and general coast topography, based on triangulation, are 358, 431, and 828 statute miles, respectively, for the past three years, the sum total now completed being 2,474 statute miles, or 21.5 per cent of the total general coast line of the Philippines. Adding to the foregoing the 1,254 miles of Spanish and British surveys, which are considered sufficient for the present needs of commerce, the total coast line charted sufficiently well for immediate demands is 32 per cent. The work of the past year equaled 8.4 per cent of the total remaining to be done on July 1, 1906, including in this total the Spanish and British work just referred to.^a

COST OF WORK.

The cost of the work in these three years has been for:

1905	\$190,425
Purchase of <i>Fathomer</i> (amount paid this fiscal year)	65,235
Total	255,660
1906	259,027
1907	272,381

^aA sketch showing the hydrographic and topographic surveys and triangulation effected by the Coast and Geodetic Survey to June 30, 1907, has been omitted and is on file in the Bureau of Insular Affairs, War Department.

OFFICE WORK.

To insure the speediest possible preparation, and communication to the public of the results in the Philippine Islands the preliminary office work, so far as practicable, is completed in the islands and the office in Manila is organized with this purpose steadily in view. The office divisions are the computing, chart construction, nautical, and correspondence and property. The director exercises general direction over all the divisions, decides on working grounds for the field parties, preparing specifications for the operations, plans schemes for charts, correction pieces and recommendations for new edition, revises chart drawings and nautical information prepared for publication, examines results of field operations, passes on all requisitions for supplies and repairs and the allotments and expenditures required for the Survey.

COMPUTING DIVISION.

This division takes charge of all the survey records (except topographical and hydrographical sheets), receipting for and registering all entries and preparing for forwarding to Washington all records required there, except in the classes just enumerated. When computations of the results of the survey have been made in the field they are verified in this division, which supplements any deficiency; and prepares all the physical and geographical data necessary for chart construction. Data is prepared here for the extension of field surveys and for the preparation of the hydrographic and topographic sheets which are gotten ready in the chart division for the use of the field parties.

From here is supplied most of the responses to the requests that are constantly being received from the army, civil bureaus and public for information for engineering, cadastral, and general improvement purposes.

CHART CONSTRUCTION.

This division has charge of all operations connected with the preparation of charts; in it are received for transmission to the Washington office all the topographic and hydrographic sheets of the survey; sheets not inked in the field are completed, using the corrected data received from the computing division, and the final verification of topographic and hydrographic sheets is made. The drawings for new charts are constructed here and prepared for publication in Washington, and hydrographic and topographic sheets containing all available data are prepared for the field parties, as also miscellaneous tracings and drawings required from time to time by the office, or furnished officially for other offices of the General Insular Government.

Chart drawings forwarded to Washington for printing, July 1, 1906, to June 30, 1907.

No.	Title.
4240	Manila and Subic bays.
4257	Anchorage in vicinity of Verde Island Passage.
4442	Port Romblon (new edition, entirely redrawn).
4649	Malalag Bay.
4619	Eastern part of Illana Bay (new edition, entirely redrawn).
4449	Port Palapag and Laoang Bay.
4719	Surigao Strait (addition for new edition).
4645	Vicinity of Zamboanga.
4266	Ports Masinloc and Matalvi (new edition, almost entirely redrawn).
4267	Pagbilao and Lagulmanoc bays, and Lucena anchorage.
4641	Murcielagos Bay (new edition, entirely redrawn).
4722	Sulu Archipelago (addition for new edition).
4210	Dasol Bay to Iba.
4648	Vicinity of Davao and Pakiputan Strait.
4343	Puerto Princesa (new edition, entirely redrawn).
4222	Lagonoy Gulf to Sisiran Bay (new edition, almost entirely redrawn).
4243	Manila and Cavite anchorages (new edition, extensive addition).
4728	Western Mindanao (new edition, 50 per cent redrawn).
4206	Lingayen Gulf (new edition, 30 per cent redrawn).
4447	Cebu Harbor approaches (new edition, entirely redrawn).
4460	Nofo Strait (additions for new edition).
4220	San Bernardino Strait (addition for new edition).
	Total..... 22 charts.

Eight of the above are new charts, 9 are complete redrawings for new edition, and 5 are extensive correction drawings for new edition.

Charts published in Washington, July 1, 1906, to June 30, 1907.

No.	Title.
4259	Rapurapu Strait (new edition).
4544	Siasi and Lapac Islands.
4512	Samal Islands.
4309	Balabac Strait.
4713	East coast of Luzon (new edition).
4718	Panay, Negros, and Cebu, with parts of Bohol and <i>Leyte</i> (new edition).
4711	Northern Luzon.
4257	Anchorage in vicinity of Verde Island Passage.
4647	Agusan River entrance.
4240	Manila and Subic bays.
4480	Iloilo Strait.
4449	Port Palapag and Laoang Bay.
4461	Oras to Sula Bay.
4442	Port Romblon (new edition).
4715	Southeastern Luzon (new edition).
4619	Eastern part of Illana Bay (new edition).
4420	Parts of Samar and <i>Leyte</i> .
4649	Malalag Bay.
4543	Isabela Channel.
Total..... 19 charts.	

Chart drawings in progress, June 30, 1907.

No.	Title.	State of progress, in percentage.
4416	Iloilo and Guimaras straits.....	95
4714	Mindoro and adjacent coasts.....	90
4717	Oyos and Cagayanes Islands.....	55
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NAUTICAL DIVISION.

This division has charge of the receipt, hand corrections, and issue of all the charts and nautical publications of the survey. Here are prepared and corrected to date the sailing directions for the archipelago; the notices to mariners which give the earliest possible information of every subject properly affecting charts which is brought to our attention. Files of every chart of any value for these islands are kept on hand and freely placed at the disposal of all interested. Shipmasters in this division find readily available for their use all the data we can collect and are invited to bring here their charts for inspection and correction. At the request of the director of the bureau of navigation, the chief of this division has been named a member of the light-house board for the archipelago. The ship records and reports are filed in this division; which also assists in the inspection for decision on repairs of magnitude and for any extensive outfitting necessary for coast and geodetic survey vessels.

The following publications have been prepared, verified, and published: Notice to Mariners, numbers 1 to 10, 1906; Notice to Mariners, numbers 1 to 7, 1907.

Sailing directions, Section III, Panay, Negros, Cebu, and adjacent islands, 1906 (third edition).

DISTRIBUTION OF PUBLICATIONS

Charts sold.....	2, 376
Official use.....	5, 631
Total.....	8, 007
Tide Tables.....	204
Sailing Directions, Philippine Islands.....	1, 736
Notice to Mariners, Philippine Islands.....	7, 774
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This summary is exclusive of the number of publications sent to Washington for distribution. The increase in the quantity of charts sold this year over the sales for last year is 34 per cent.

CORRESPONDENCE AND PROPERTY DIVISION.

This division has charge of all the clerical and property operations of the survey. The difference in requirements of the two departments under which we are operating makes an unusually heavy amount of clerical labor when compared to ordinary coast and geodetic survey requirements.

In the office sections just named throughout the year Mr. E. R. Frisby, chief computer, has been in charge of the computing division; Mr. John Bach, chief cartographer, has had charge of the chart construction division; Capt. John C. Dow, nautical expert, had charge of the nautical division, and Mr. W. H. Macdonald has been chief clerk and in charge of the correspondence and property division.

CONCLUSION.

Mr. G. R. Putnam, assistant, coast and geodetic survey, was director of coast surveys from July 1 to July 14; on the last date he was succeeded by Mr. John E. McGrath, assistant, coast and geodetic survey.

The joint arrangement between the general and insular governments under which the survey is operated remained unchanged.

There have been constant exchanges of information and good offices between the survey and the various military and civil interests having common aims, and the experience of the director is that the most gratifying interest has been shown in meeting all of his requests for information, while on our part the aim of the survey has been to aid in every possible way that propriety would permit in giving the widest publicity to all information of value that comes in its possession.

Special mention must be made of the obligation we feel for many favors to the chief engineer of the Philippine Division, chief of military information division, bureau of navigation, and its light-house and port works divisions, the bureau of public works, the bureau of forestry, and the bureau of customs.

In return the army has been supplied with information for nearly all of the numerous parties recently employed on the military survey made of the country contiguous to Manila, and for work in Samar and Mindanao; the bureau of public lands has been furnished very complete data for its cadastral work, and the bureau of forestry has been similarly accommodated. Information has also been fully furnished to the engineers engaged in the extensive schemes of railway development which are now in progress in various sections of the archipelago.

In addition to the above the office is being constantly called on by other branches of the government and by private parties for information and results which are supplied whenever practicable to the fullest extent of our means.

The sketch hereto attached shows the progress to June 30, 1907, of the triangulation, hydrography, topography, latitude and longitude work executed by the coast and geodetic survey in the Philippine Islands.

Very respectfully,

JOHN E. MCGRATH,
Director of Coast Surveys.

To the honorable the SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

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